

American Housing Survey

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**Components of  
Inventory Change  
And Rental Market Dynamics:  
Buffalo  
1994-2002**

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# Components of Inventory Change and Rental Market Dynamics: Buffalo 1994-2002

## Overview

Housing analysts use two techniques—Components of Inventory Change (CINCH) and rental market dynamics—to look at a housing market at two points in time and explain how the observed changes 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 units that were affordable to low-income households at the beginning of the period?”

Previously HUD commissioned CINCH and rental market dynamics analyses using the national American Housing Survey (AHS).<sup>1</sup> This report focuses on the Buffalo metropolitan housing market over the period between 1994 and 2002. It is one of 13 reports based on local American Housing Surveys conducted in 2002; these 13 metropolitan areas were previously surveyed in either 1994 or 1995.

CINCH and rental market analysis have both forward-looking and backward-looking components. In the forward-looking components, analysts start with the housing stock available at the beginning of the period and then, looking at the end of the period, attempt 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. In the backward-looking component, analysts start with the housing stock available at the end of the period and, looking at the beginning of the period, attempt 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 1994 may have become a medical office in 1997, but returned to being a housing unit in 2000. CINCH

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<sup>1</sup> See <http://www.huduser.org/datasets/cinch.html> and <http://www.huduser.org/datasets/ahs/ahsReports.html#2>.

would record this unit as having undergone no change over the period from 1994 to 2002. In classical analytical 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 analysis in this report uses the AHS, which is a sample of units at both points in time; and, unfortunately, previous efforts using the AHS have demonstrated that creating sample weights that take both periods into account generates some inconsistent or inaccurate results. For this reason, the most recent analyses have separated the forward-looking and backward-looking components. This report will do the same. (Weighting is explained briefly in Appendix B and more fully in a separate paper cited in the 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 1994 to 2002 and identifying how units were lost to the housing stock; and a set of backward-looking tables tracing where 2002 units came from and distinguishing between units that were part of the stock in 1994 and units that were additions to the stock since 1994.
- A brief discussion of the rental market dynamics.
- Two rental market dynamics tables, one forward-looking and one backward-looking.

At various places, the discussion points out some of the limitations of these analyses or of using the AHS metropolitan samples for these analyses.

Two appendixes 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 1994 housing stock by 2002. There are three basic dispositions of 1994 units: units that continue to exist in 2002 with the same characteristics (or serving the same market), units that continue to exist in 2002 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 2002 housing stock came from in reference to 1994. There are three basic sources of 2002 units: units that existed in 1994 with the same characteristics (or serving the same market), units that existed in 1994 but with different characteristics (or serving a different market), and units that are additions to the housing stock.

Since the essence of the CINCH analysis is in the columns, we will explain the columns in detail.

### **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 1994 AHS report for Buffalo counted 458,800 occupied units (column B, row 2, Forward-Looking Table 1); the 2002 AHS report counted 461,300 occupied units (column B, row 2, 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 (1994 for the forward-looking tables and 2002 for the backward-looking tables); and (b) satisfying the condition in column A. CINCH uses different weights than those used in preparing the published reports. Therefore, CINCH estimates can differ from AHS estimates for particular subsets of the housing stock. As explained in Appendix B, the weights were created to match AHS published totals for rows 2 through 4 of Table 1. This perfect match will not be true of other rows.<sup>2</sup> In the case of the Buffalo metropolitan area, the CINCH weights produce population estimates that are very close to the published estimates.
- Column D is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, and (b) continue to belong to the subset defined by column A. For example, column D of row 2 of Forward-

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<sup>2</sup> Columns B and C will also match, except for rounding, in row 1 of Table 1 because row 1 is defined as the sum of rows 2 through 4.

Looking Table 1 estimates that 406,860 of the occupied units were occupied in 2002.

- 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 39,450 units that were occupied in 1994 are still part of the housing stock in 2002 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—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 1994 to 2002.

- Column F is the CINCH estimate of the number of units from column C that are not in the 2002 housing stock because they were merged with other units or converted into multiple units. Among occupied units, 1,570 units 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, no mobile homes were moved out.
- Column H is the CINCH estimate of the number of units from column C that became nonresidential at the end of the period. For example, a real estate firm, a tax preparation office, a palm reader, or some other business might buy or rent a house to use for business rather than residential purposes.<sup>3</sup> Among occupied units, 1,230 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 2002. In this case, 7,270 units were demolished or destroyed.
- Column J is the CINCH estimate of the number of units from column C that by 2002 were condemned or that were no longer usable for housing because of extensive damage. Among occupied units, 1,920 units are no longer usable for housing.

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<sup>3</sup> If the owner or tenant both lives in a unit and conducts business out of the unit, the AHS considers the unit to be residential. So nonresidential means strictly no residential use.

- Column K is the CINCH estimate of the number of units from column C that were lost by 2002 for other reasons. These include units that the Census Bureau eliminated for sampling purposes and other miscellaneous losses. Among occupied units, there were 490 units lost for these miscellaneous reasons.

The columns form a closed system. Column C counts the number of units tracked; columns D through K account for all the possible outcomes. Therefore, column C minus the sum of columns D through K always equals zero, except for rounding.<sup>4</sup>

## Columns Unique to Backward-Looking Tables

In backward-looking tables, columns F through I track where units came from that are part of the housing stock in 2002, but were not part of the housing stock in 1994.<sup>5</sup>

- Column F is the CINCH estimate of the number of mobile homes from column C that were moved in during the period. Among occupied units, no mobile homes were moved in (column F, row 2 of Backward-Looking Table 1).<sup>6</sup>
- Column G is the CINCH estimate of the number of units from column C that had been nonresidential in 1994. Among occupied units, 230 had been nonresidential.
- Column H is the CINCH estimate of the number of units from column C that were newly constructed between 1994 and 2002. Among occupied units, 17,620 units were newly constructed.
- Column I is the CINCH estimate of the number of units from column C that were added by 2002 for other reasons. These include units that were considered temporary losses because occupancy was prohibited in 1994 or the interior of the unit was exposed to the elements, and also units that the Census Bureau considered temporarily lost to the housing stock for reasons “not classified.” Among occupied units, 240 had been temporarily lost to the stock in 1994.

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<sup>4</sup> The weighted numbers are rounded to the nearest 10. The AHS publication rounds to the nearest 100. We found that rounding to the nearest 10 worked better for the metropolitan sites. The weights were typically in the range of 100 to 300 and in many rows the numbers in columns F through K were small. With a weight of 149, rounding to the nearest hundred would mean that one sample observation would be rounded to 100, two sample observations to 300, and three sample observations to 400. Rounding to the nearest ten results in weighted totals of 150, 300, and 450 for these cases.

<sup>5</sup> This list does not contain a column for units added through mergers and conversions. The Census Bureau did not code the variable that would normally identify mergers and conversions in 2002 (REUAD=7 or 8).

<sup>6</sup> The Census Bureau did not code the variable that would normally identify mobile home move-ins in 2002 (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, vacant units, and seasonal units.

Rows 5-12 divide the housing stock by type of structure to identify what type of units account for losses.<sup>7</sup> 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 the case of Buffalo, units that would have been classified in row 10 of Forward-Looking Table 1 were placed in another category to preserve the confidentiality of respondents.

Rows 13-23 divide the housing stock by year built.<sup>8</sup> The published reports use the categories 1990-1994, 1995-1999, and 2000-2004; we use 1990-1994 and 1995-2002 to isolate units newly constructed since the previous AHS survey.<sup>9</sup> Column I shows that losses due to demolition or disasters were heavily concentrated in the older units. Among units built in 1929 or earlier, 5 percent were demolished or destroyed by 2002.

Rows 24-30 and 31-35 divide the housing stock by two different measures of interior space, the number of rooms and the number of bedrooms.<sup>10</sup> Column H in the forward-looking table and column G in the backward-looking table show that smaller units in terms of the number of rooms are more likely to move into and out of nonresidential use.

Rows 36-41 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. In the case of Buffalo, the Census Bureau does not report a number of stories above 6. In general, the published reports contain matching data for row 36 only.

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<sup>7</sup> In general, the CINCH estimates exceed published AHS estimates for single-family detached units and fall short of the published AHS estimates for manufactured homes by roughly equal amounts.

<sup>8</sup> Row 13 is not included in the forward-looking tables, because the 1994 housing stock cannot contain units built after 1994.

<sup>9</sup> We use REUAD=3 and not year built to identify new construction. For this reason, there are units built after 1994 that are not considered new construction. In addition, year built is obtained from the respondent interview and may be inaccurate.

<sup>10</sup> Because of small sample sizes in the losses and additions columns, we combined room categories that the published reports list separately.

Rows 42-43 divide the housing stock between central cities units and suburban residences to determine how the observed changes vary by location. In Buffalo, 6 percent of central city units were demolished or destroyed between 1994 and 2002; less than 1 percent of suburban units were demolished or destroyed. Ninety-five percent of all new construction occurred in the suburbs. Rows 44-45 divide the housing stock by whether or not the occupants have moved in within the last two calendar years to determine if certain units consistently have high turnover and to see if high turnover units are more susceptible to loss.

## Table 2

This table pertains to 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 6-8 look at each of these requirements separately. In the 1994 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 6-8 attempted to separate out good units from the least desirable units, based on kitchen and bath equipment, to compare how they changed over the period.

Rows 9-13 pertain to how units obtain water and dispose of sewage.

Rows 14-19 look at units with serious problems. Rows 15-19 identify specific types of serious deficiencies. Row 14 counts the units having one or more of these deficiencies. Rows 20-25 look at units with moderate problems. Rows 21-25 identify specific types of deficiencies. Row 20 counts the units having one or more of these deficiencies.<sup>11</sup> These rows are in the analysis to answer two questions: whether poor-quality units in one year are also poor-quality units in the other year, and whether poorer quality units are more likely to be lost. Both the forward-looking and backward-looking analyses indicate that there is some continuity over the 8 years with respect to having serious physical problems. Fewer than 14 percent of the units with serious problems in 1994 had serious problems in 2002, and fewer than 8 percent of the units with serious problems in 2002 had serious problems in 1994. Fewer than 6 percent of the units with moderate problems in 1994 still had moderate problems in 2002, and fewer than 4 percent of the units with moderate problems in 2002 had moderate problems in 1994. Fewer than 2 percent of the units had serious problems in either year, and fewer than 5 percent had moderate problems in either year.

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<sup>11</sup> For definitions of serious and moderate problems see pages 998 and 999 of the AHS Codebook, version 1.77, at [http://www.huduser.org/intercept.asp?loc=/Datasets/ahs/AHS\\_Codebook.pdf](http://www.huduser.org/intercept.asp?loc=/Datasets/ahs/AHS_Codebook.pdf).

### 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.

Rows 2-3 look at the age of the householder. Rows 4-5 look at whether the household includes children. Rows 6-11 look at the race or ethnicity of the householder. Rows 12-14 look at three possible sources of household income. In all cases, the analysis seeks to determine how stable the occupancy characteristics are over time, and what part of the market was served by units that lost between 1994 and 2002. Units occupied by Black householders were 12 times more likely to be demolished or destroyed than units occupied by White householders (8.2 percent versus 0.6 percent).

### 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 determine the extent to which units change tenure characteristics and whether rental or owner-occupied units are more likely to be lost. Rental units in Buffalo were 10 times as likely to be lost due to demolition or disasters as owner-occupied units.

Rows 5-11 contain a partial rental dynamics analysis.<sup>12</sup> Row 5 identifies non-market units, a class that includes subsidized units and units provided for no cash rents; for example, units given to maintenance or management personnel or to relatives. The remaining rows divide market rental units into affordability classes. In defining affordability, the analysis sets boundaries for each class based on the highest rent a household in an income group could afford without spending more than 30 percent of its monthly income on rent. Ideally there would be six categories in each metropolitan area:

- Extremely-low-rent units (rents affordable to households with incomes equal to 35 percent of area median family income).
- Very-low-rent units (rents not affordable at 35 percent, but affordable at 50 percent of area median family income).
- Low-rent units (rents not affordable at 50 percent, but affordable at 65 percent of area median family income).
- Moderate-rent units (rents not affordable at 65 percent, but affordable at 80 percent of area median family income).

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<sup>12</sup> The rental dynamics analysis is partial because it traces movement out of, but not into, particular rental classes. Tables A and B in the final section of this report contain a complete rental dynamics analysis.

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- High-rent units (rents not affordable at 80 percent, but affordable at 100 percent of area median family income).
- Very-high-rent units (rents not affordable at 100 percent of area median family income).

For most metropolitan areas studied, the number of categories is fewer than six, because the Census Bureau had to place an upper limit on the rents reported in the public-use data to protect the confidentiality of respondents. In Buffalo there are only three classes, with low-rent, moderate-rent, high-rent, and very-high-rent units grouped into one class.

Rows 12-16 track rental units by household income; rows 22-26 track owner-occupied units by household income.<sup>13</sup>

Rows 17-21 identify owner-occupied units by total monthly housing costs.<sup>14</sup>

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<sup>13</sup> Because of small sample sizes in the losses and additions columns, we combined income categories that the published reports list separately.

<sup>14</sup> Because of small sample sizes in the losses and additions columns, we combined cost categories that the published reports list separately.

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

	A Characteristics	B Published numbers	C Present in 1994	D 1994 units present in 2002	E Change in character- istics	F '94 units affected by conversion /merger	G '94 mobile homes moved out	H '94 units changed to nonresidential use	I '94 units lost through demolition or disaster	J '94 units badly damaged or condemned	K '94 units lost in other ways	
1	<b>Total Housing Stock</b>	503,200	503,200	482,620	0	2,990	0	1,890	11,710	2,890	1,120	1
	<b>Occupancy Status</b>											
2	Occupied	458,800	458,800	406,860	39,450	1,570	0	1,230	7,270	1,920	490	2
3	Vacant	40,600	40,600	10,510	21,990	1,420	0	650	4,430	970	630	3
4	Seasonal	3,800	3,800	2,290	1,510	0	0	0	0	0	0	4
	<b>Units in Structure</b>											
5	1, detached	288,600	291,690	288,270	0	0	0	360	2,360	270	430	5
6	1, attached	12,700	12,700	11,010	0	0	0	620	540	420	110	6
7	2 to 4	149,200	148,950	135,580	0	2,880	0	790	7,230	1,890	580	7
8	5 to 9	23,700	23,870	23,330	0	0	0	110	320	100	0	8
9	10 to 19	7,500	19,340	17,920	0	110	0	0	1,100	210	0	9
10	20 to 49	5,300	0	0	0	0	0	0	0	0	0	10
11	50 or more	7,200	590	590	0	0	0	0	0	0	0	11
12	Mobile Home/trailer	9,000	6,060	5,910	0	0	0	0	150	0	0	12
	<b>Year Built</b>											
14	1990-1994	16,500	15,860	15,740	0	0	0	0	120	0	0	14
15	1985-1989	16,900	16,150	16,150	0	0	0	0	0	0	0	15
16	1980-1984	8,600	8,460	8,460	0	0	0	0	0	0	0	16
17	1970-1979	46,800	45,720	45,720	0	0	0	0	0	0	0	17
18	1960-1969	64,100	62,540	61,960	0	110	0	110	370	0	0	18
19	1950-1959	76,100	77,150	75,910	0	100	0	220	260	520	150	19
20	1940-1949	44,800	46,220	44,350	0	320	0	470	800	160	110	20
21	1930-1939	63,100	62,800	58,760	0	1,100	0	410	1,620	420	490	21
22	1920-1929	58,700	59,450	54,260	0	630	0	260	3,560	740	0	22
23	1919 or earlier	107,600	108,840	101,300	0	730	0	420	4,980	1,040	380	23

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

	A Characteristics	B Published numbers	C Present in 1994	D 1994 units present in 2002	E Change in character- istics	F '94 units affected by conversion /merger	G '94 mobile homes moved out	H '94 units changed to nonresidential use	I '94 units lost through demolition or disaster	J '94 units badly damaged or condemned	K '94 units lost in other ways	
	<b>Rooms</b>											
24	1 – 4 rooms	119,800	116,960	87,980	18,770	1,810	0	1,000	4,810	1,830	760	24
25	5 rooms	113,000	112,450	61,650	45,670	580	0	670	3,130	490	250	25
26	6 rooms	127,800	129,580	75,260	50,660	490	0	220	2,450	400	110	26
27	7 rooms	76,800	78,340	38,230	39,080	100	0	0	760	160	0	27
28	8 rooms	37,500	37,150	16,840	19,990	0	0	0	320	0	0	28
29	9 rooms	19,600	19,930	7,560	12,250	0	0	0	120	0	0	29
30	10 rooms or more	8,900	8,790	2,370	6,310	0	0	0	110	0	0	30
	<b>Bedrooms</b>											
31	None	4,000	4,460	2,090	1,220	110	0	100	620	210	110	31
32	1	43,900	42,530	29,280	9,420	1,030	0	310	1,200	840	440	32
33	2	147,400	144,310	106,510	28,880	1,360	0	950	5,140	1,170	310	33
34	3	218,100	222,210	183,820	33,540	380	0	520	3,130	670	150	34
35	4 or more	89,800	89,680	71,380	16,460	100	0	0	1,630	0	110	35
36	<b>Multiunit Structures</b>	192,900	192,750	177,420	0	2,990	0	900	8,660	2,200	580	36
	<b>Stories in Structures</b>											
37	1		2,360	2,150	0	0	0	0	210	0	0	37
38	2		25,090	21,450	0	420	0	260	2,280	420	260	38
39	3		127,010	118,520	0	2,260	0	430	4,220	1,250	320	39
40	4 to 6		38,290	35,310	0	310	0	210	1,940	520	0	40
41	7 or more		0	0	0	0	0	0	0	0	0	41
	<b>Metro Status</b>											
42	In central cities		150,830	137,120	0	1,500	0	490	9,450	1,960	320	42
43	In suburbs		352,370	345,500	0	1,490	0	1,400	2,250	930	800	43
	<b>Mover Status</b>											
44	Moved in last 2 years		77,250	19,320	52,740	210	0	640	3,460	880	0	44
45	Not a recent mover		381,550	332,210	42,040	1,360	0	590	3,810	1,040	490	45

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

	A Characteristics	B Published numbers	C Present in 1994	D 1994 units present in 2002	E Change in character- istics	F '94 units affected by conversion /merger	G '94 mobile homes moved out	H '94 units changed to nonresidential use	I '94 units lost through demolition or disaster	J '94 units badly damaged or condemned	K '94 units lost in other ways	
1	<b>Occupied Units</b>	458,800	458,800	406,860	39,450	1,570	0	1,230	7,270	1,920	490	1
	<b>Kitchen</b>											
2	With complete kitchen	454,500	454,690	394,230	48,680	1,460	0	1,230	6,890	1,810	380	2
3	Lacking complete kitchen facilities	4,300	4,110	590	2,810	110	0	0	390	110	110	3
	<b>Plumbing</b>											
4	With all plumbing facilities	457,200	457,280	400,520	44,490	1,350	0	1,230	7,270	1,920	490	4
5	Lack some plumbing	1,600	1,520	590	710	220	0	0	0	0	0	5
6	No hot piped water	0	350	240	0	110	0	0	0	0	0	6
7	No bathtub/shower	500	930	470	240	220	0	0	0	0	0	7
8	No flush toilet	400	1,420	470	830	110	0	0	0	0	0	8
	<b>Water</b>											
9	Public/private water	441,200	440,010	388,300	39,220	1,570	0	1,230	7,270	1,920	490	9
10	Well	16,600	17,770	12,780	4,980	0	0	0	0	0	0	10
11	Other water source	1,000	1,030	170	860	0	0	0	0	0	0	11
	<b>Sewer</b>											
12	Public sewer	413,100	410,630	358,490	40,190	1,460	0	1,130	7,170	1,710	490	12
13	Septic tank/cesspool	45,500	47,940	41,030	6,480	0	0	110	110	210	0	13
	<b>Severe Problems</b>											
14	<b>Severe Problems</b>	3,700	3,560	470	2,600	220	0	0	280	0	0	14
15	Plumbing	1,600	1,520	470	830	220	0	0	0	0	0	15
16	Heating	1,400	1,470	0	1,360	0	0	0	110	0	0	16
17	Electric	100	0	0	0	0	0	0	0	0	0	17
18	Upkeep	600	570	0	410	0	0	0	160	0	0	18
19	Hallways	0	0	0	0	0	0	0	0	0	0	19
	<b>Moderate problems</b>											
20	<b>Moderate problems</b>	13,700	13,450	750	10,510	0	0	220	1,640	220	110	20
21	Plumbing	800	590	0	370	0	0	0	110	110	0	21
22	Heating	900	910	110	580	0	0	110	110	0	0	22
23	Kitchen	3,200	4,110	590	2,810	110	0	0	390	110	110	23
24	Upkeep	8,900	8,990	120	7,630	0	0	110	1,140	0	0	24
25	Hallways	200	120	0	120	0	0	0	0	0	0	25

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

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

	A Characteristics	B Published numbers	C Present in 1994	D 1994 units present in 2002	E Change in character- istics	F '94 units affected by conversion /merger	G '94 mobile homes moved out	H '94 units changed to nonresidential use	I '94 units lost through demolition or disaster	J '94 units badly damaged or condemned	K '94 units lost in other ways	
1	<b>Occupied units</b>	458,800	458,800	406,860	39,450	1,570	0	1,230	7,270	1,920	490	1
	<b>Age</b>											
2	Under 65	346,300	344,950	266,070	67,370	1,360	0	1,120	6,730	1,810	490	2
3	65 or older	112,500	113,850	67,350	45,520	210	0	110	540	110	0	3
	<b>Children</b>											
4	Some	154,600	154,530	81,600	68,350	320	0	210	3,280	550	220	4
5	None	304,200	304,270	215,470	80,890	1,250	0	1,020	4,000	1,370	270	5
	<b>Race/Origin</b>											
6	White	401,700	401,120	348,360	46,480	1,080	0	1,020	2,600	1,210	380	6
7	Hispanic	4,700	4,790	2,040	2,200	110	0	0	330	110	0	7
8	Non-Hispanic	397,000	396,330	342,380	48,220	970	0	1,020	2,270	1,100	380	8
9	Black	48,600	48,910	30,930	12,660	490	0	110	4,020	600	110	9
10	Other	8,500	8,760	3,250	4,650	0	0	110	660	110	0	10
11	Total Hispanics	7,300	7,610	3,160	3,460	110	0	110	660	110	0	11
	<b>Income Source</b>											
12	Wages and salaries	328,200	325,340	248,400	70,160	1,250	0	800	3,600	920	220	12
13	Welfare or SSI	38,300	38,920	9,040	25,220	320	0	220	3,140	710	270	13
14	Social security or pension	154,700	156,520	92,780	61,770	430	0	110	1,030	400	0	14

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

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

	A Characteristics	B Published numbers	C Present in 1994	D 1994 units present in 2002	E Change in character- istics	F '94 units affected by conversion /merger	G '94 mobile homes moved out	H '94 units changed to nonresidential use	I '94 units lost through demolition or disaster	J '94 units badly damaged or condemned	K '94 units lost in other ways	
1	<b>Occupied units</b>	458,800	458,800	406,860	39,450	1,570	0	1,230	7,270	1,920	490	1
	<b>Tenure</b>											
2	Owner occupied	306,500	307,230	268,580	36,440	320	0	0	1,240	380	270	2
3	Percent own occupied	66.8%	67.0%	66.0%	NA	20.6%	NA	0.0%	17.1%	19.9%	54.6%	3
4	Renter occupied	152,200	151,570	102,210	39,090	1,250	0	1,230	6,030	1,540	220	4
	<b>Rental Affordability</b>											
5	Non-market		26,240	8,800	14,430	210	0	110	2,470	110	110	5
6	Extremely low rent		57,070	26,460	26,260	330	0	540	2,480	890	110	6
7	Very low rent		48,790	18,430	27,880	710	0	480	870	430	0	7
8	Low to very high rent		19,470	4,900	14,140	0	0	110	210	110	0	8
	<b>Renter Hsd Income</b>											
12	Less than \$20,000	83,300	84,280	34,160	42,550	320	0	430	5,270	1,330	220	12
13	\$20,000 to \$34,999	39,800	38,510	7,490	29,510	490	0	370	550	110	0	13
14	\$35,000 to \$59,999	24,400	24,170	4,630	18,560	440	0	430	110	0	0	14
15	\$60,000 to \$99,999	3,800	3,510	380	2,910	0	0	0	110	110	0	15
16	\$100,000 or more	1,100	1,100	110	980	0	0	0	0	0	0	16
	<b>Owner Monthly Housing Costs</b>											
17	Less than \$499	121,600	124,160	67,240	55,950	220	0	0	480	110	160	17
18	\$500 to \$699	47,700	48,230	11,570	36,340	110	0	0	110	110	0	18
19	\$700 to \$999	66,500	66,570	24,790	41,350	0	0	0	160	160	110	19
20	\$1,000 to \$1,499	37,600	36,890	16,990	19,750	0	0	0	160	0	0	20
21	\$1,500 or more	13,400	12,260	7,320	4,940	0	0	0	0	0	0	21
a	Missing mort data	19,800	19,130	2,550	16,250	0	0	0	330	0	0	a
	<b>Owner Hsd Income</b>											
22	Less than \$20,000	60,700	60,630	19,290	39,820	210	0	0	760	380	160	22
23	\$20,000 to \$34,999	72,400	72,380	18,470	53,530	110	0	0	160	0	110	23
24	\$35,000 to \$59,999	94,700	94,480	26,170	68,160	0	0	0	160	0	0	24
25	\$60,000 to \$99,999	60,000	60,260	19,260	40,840	0	0	0	160	0	0	25
26	\$100,000 or more	18,800	19,490	8,980	10,510	0	0	0	0	0	0	26

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

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

	A Characteristics	B Published numbers	C Present in 2002	D 2002 units present in 1994	E Change in character- istics	F '02 mobile homes moved in	G '02 units derived from nonresidential use	H '02 units added by new construction	I '02 units added from temporary losses	
1	<b>Total</b>	515,500	515,500	494,490	0	0	2,370	18,410	240	1
	<b>Occupancy Status</b>									
2	Occupied	461,300	461,300	418,290	24,910	0	230	17,620	240	2
3	Vacant	50,800	50,800	10,760	37,230	0	2,130	670	0	3
4	Seasonal	3,400	3,400	2,040	1,240	0	0	110	0	4
	<b>Units in Structure</b>									
5	1, detached	312,800	314,670	302,170	0	0	110	12,390	0	5
6	1, attached	16,700	16,830	13,820	0	0	270	2,740	0	6
7	2 to 4	130,600	131,090	130,180	0	0	250	430	240	7
8	5 to 9	26,000	26,040	24,530	0	0	0	1,510	0	8
9	10 to 19	7,800	6,560	6,180	0	0	120	260	0	9
10	20 to 49	4,200	5,010	4,690	0	0	0	320	0	10
11	50 or more	8,500	9,140	6,860	0	0	1,630	660	0	11
12	Mobile Home/trailer	8,900	6,160	6,060	0	0	0	100	0	12
	<b>Year Built</b>									
13	1995-2002	18,500	17,130	340	0	0	120	16,670	0	13
14	1990-1994	18,300	17,760	16,020	0	0	0	1,740	0	14
15	1985-1989	16,300	16,380	16,250	0	0	130	0	0	15
16	1980-1984	8,800	8,830	8,830	0	0	0	0	0	16
17	1970-1979	48,000	47,370	47,370	0	0	0	0	0	17
18	1960-1969	63,100	62,760	62,650	0	0	110	0	0	18
19	1950-1959	77,400	77,920	77,920	0	0	0	0	0	19
20	1940-1949	45,600	45,930	45,820	0	0	110	0	0	20
21	1930-1939	61,000	60,220	60,120	0	0	110	0	0	21
22	1920-1929	56,700	57,170	55,490	0	0	1,570	0	120	22
23	1919 or earlier	101,800	104,030	103,680	0	0	230	0	120	23

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

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

	A Characteristics	B Published numbers	C Present in 2002	D 2002 units present in 1994	E Change in character- istics	F '02 mobile homes moved in	G '02 units derived from nonresidential use	H '02 units added by new construction	I '02 units added from temporary losses	
	<b>Rooms</b>									
24	1 – 4 rooms	122,200	121,540	90,000	25,340	0	1,980	4,220	0	24
25	5 rooms	110,100	108,660	63,170	41,000	0	380	3,990	120	25
26	6 rooms	130,800	131,000	77,200	50,090	0	0	3,590	120	26
27	7 rooms	80,300	81,120	39,240	38,490	0	0	3,400	0	27
28	8 rooms	40,300	40,820	17,310	22,390	0	0	1,110	0	28
29	9 rooms	19,600	20,200	7,770	11,380	0	0	1,050	0	29
30	10 rooms or more	12,400	12,150	2,430	8,680	0	0	1,050	0	30
	<b>Bedrooms</b>									
31	None	3,600	4,080	2,130	1,600	0	220	130	0	31
32	1	42,600	41,590	29,950	8,760	0	1,650	1,240	0	32
33	2	138,900	137,840	109,120	23,650	0	230	4,730	120	33
34	3	230,300	230,900	188,580	33,130	0	270	8,800	120	34
35	4 or more	100,100	101,080	73,260	24,320	0	0	3,500	0	35
36	<b>Multiunit Structures</b>	177,100	177,840	172,440	0	0	1,990	3,170	240	36
	<b>Stories in Structures</b>									
37	1		3,900	3,900	0	0	0	0	0	37
38	2		65,470	63,090	0	0	0	2,260	120	38
39	3		85,510	84,100	0	0	370	920	120	39
40	4 to 6		18,330	16,930	0	0	1,410	0	0	40
41	7 or more		4,630	4,410	0	0	220	0	0	41
	<b>Metro Status</b>									
42	In central cities		143,150	140,350	0	0	1,750	820	240	42
43	In suburbs		372,350	354,140	0	0	620	17,590	0	43
	<b>Mover Status</b>									
44	Moved in last 2 years		76,630	19,870	51,430	0	230	4,980	120	44
45	Not a recent mover		384,670	328,540	43,370	0	0	12,640	120	45

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

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

	A Characteristics	B Published numbers	C Present in 2002	D 2002 units present in 1994	E Change in character- istics	F '02 mobile homes moved in	G '02 units derived from nonresidential use	H '02 units added by new construction	I '02 units added from temporary losses	
1	<b>Occupied Units</b>	461,300	461,300	418,290	24,910	0	230	17,620	240	1
	<b>Kitchen</b>									
2	With complete kitchen	448,100	448,660	405,310	25,510	0	230	17,360	240	2
3	Lacking complete kitchen facilities	13,200	12,640	610	11,770	0	0	260	0	3
	<b>Plumbing</b>									
4	With all plumbing facilities	455,200	455,210	411,780	25,340	0	230	17,620	240	4
5	Lack some plumbing	6,100	6,090	610	5,480	0	0	0	0	5
6	No hot piped water	1,100	1,170	250	920	0	0	0	0	6
7	No bathtub/shower	500	490	490	0	0	0	0	0	7
8	No flush toilet	500	490	490	0	0	0	0	0	8
	<b>Water</b>									
9	Public/private water	446,400	444,300	399,210	28,140	0	230	16,480	240	9
10	Well	14,600	16,350	13,140	2,060	0	0	1,150	0	10
11	Other water source	300	650	180	470	0	0	0	0	11
	<b>Sewer</b>									
12	Public sewer	411,400	409,360	368,570	26,370	0	230	13,950	240	12
13	Septic tank/cesspool	50,000	51,940	42,190	6,080	0	0	3,670	0	13
	<b>Severe Problems</b>									
14	<b>Severe Problems</b>	8,100	7,870	610	7,130	0	0	130	0	14
15	Plumbing	6,100	6,090	610	5,480	0	0	0	0	15
16	Heating	1,200	1,150	0	1,020	0	0	130	0	16
17	Electric	800	630	0	630	0	0	0	0	17
18	Upkeep	400	420	0	420	0	0	0	0	18
19	Hallways	0	0	0	0	0	0	0	0	19
	<b>Moderate problems</b>									
20	<b>Moderate problems</b>	20,900	20,190	770	19,040	0	0	260	120	20
21	Plumbing	100	120	0	120	0	0	0	0	21
22	Heating	2,100	2,150	120	2,030	0	0	0	0	22
23	Kitchen	12,400	12,640	610	11,770	0	0	260	0	23
24	Upkeep	6,700	7,160	120	6,920	0	0	0	120	24
25	Hallways	300	120	0	120	0	0	0	0	25

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

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

	<b>A</b> Characteristics	<b>B</b> Published numbers	<b>C</b> Present in 2002	<b>D</b> 2002 units present in 1994	<b>E</b> Change in character- istics	<b>F</b> '02 mobile homes moved in	<b>G</b> '02 units derived from nonresidential use	<b>H</b> '02 units added by new construction	<b>I</b> '02 units added from temporary losses	
1	<b>Occupied units</b>	461,300	461,300	418,290	24,910	0	230	17,620	240	1
	<b>Age</b>									
2	Under 65	348,500	347,040	273,550	58,480	0	230	14,540	240	2
3	65 or older	112,800	114,260	69,250	41,930	0	0	3,080	0	3
	<b>Children</b>									
4	Some	154,400	156,610	83,890	63,940	0	120	8,420	240	4
5	None	307,000	304,690	221,520	73,840	0	120	9,200	0	5
	<b>Race/Origin</b>									
6	White	397,400	397,240	358,150	23,010	0	230	15,720	120	6
7	Hispanic	6,700	6,260	2,090	4,050	0	0	0	120	7
8	Non-Hispanic	390,700	390,980	352,000	23,020	0	230	15,720	0	8
9	Black	50,500	50,470	31,800	17,520	0	0	1,150	0	9
10	Other	13,400	13,600	3,340	9,390	0	0	750	120	10
11	Total Hispanics	11,500	11,170	3,250	7,700	0	0	100	120	11
	<b>Income Source</b>									
12	Wages and salaries	345,000	344,510	255,380	74,570	0	230	14,090	240	12
13	Welfare or SSI	31,500	31,060	9,290	20,650	0	0	1,110	0	13
14	Social security or pension	153,900	154,270	95,380	54,200	0	0	4,680	0	14

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

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

	A Characteristics	B Published numbers	C Present in 2002	D 2002 units present in 1994	E Change in character- istics	F '02 mobile homes moved in	G '02 units derived from nonresidential use	H '02 units added by new construction	I '02 units added from temporary losses	
1	<b>Occupied units</b>	461,300	461,300	418,290	24,910	0	230	17,620	240	1
	<b>Tenure</b>									
2	Owner occupied	314,100	315,620	276,130	25,620	0	0	13,760	120	2
3	Percent own occupied	68.1%	68.4%	66.0%	NA	NA	0.0%	78.1%	50.0%	3
4	Renter occupied	147,200	145,680	105,080	36,380	0	230	3,870	120	4
	<b>Rental Affordability</b>									
5	Non-market		23,970	9,050	14,010	0	0	920	0	5
6	Extremely low rent		63,080	27,200	35,110	0	120	520	120	6
7	Very low rent		43,830	18,950	24,030	0	0	850	0	7
8	Low to very high rent		14,800	5,040	8,080	0	120	1,570	0	8
	<b>Renter Hsd Income</b>									
12	Less than \$20,000	68,000	67,500	35,120	30,490	0	120	1,770	0	12
13	\$20,000 to \$34,999	36,400	36,230	7,700	27,760	0	0	660	120	13
14	\$35,000 to \$59,999	31,400	30,570	4,760	24,640	0	120	1,050	0	14
15	\$60,000 to \$99,999	10,400	10,280	390	9,630	0	0	260	0	15
16	\$100,000 or more	1,100	1,100	120	850	0	0	130	0	16
	<b>Owner Monthly Housing Costs</b>									
17	Less than \$499	114,200	106,830	69,130	36,030	0	0	1,670	0	17
18	\$500 to \$699	46,500	43,870	11,890	30,520	0	0	1,340	120	18
19	\$700 to \$999	65,900	67,070	25,480	39,980	0	0	1,610	0	19
20	\$1,000 to \$1,499	61,500	67,950	17,460	46,170	0	0	4,320	0	20
21	\$1,500 or more	26,000	29,890	10,150	14,930	0	0	4,820	0	21
	<b>Owner Hsd Income</b>									
22	Less than \$20,000	51,500	50,910	19,830	30,030	0	0	1,050	0	22
23	\$20,000 to \$34,999	59,100	58,210	18,990	37,820	0	0	1,280	120	23
24	\$35,000 to \$59,999	76,500	77,420	26,900	47,280	0	0	3,240	0	24
25	\$60,000 to \$99,999	81,800	81,970	19,800	57,020	0	0	5,140	0	25
26	\$100,000 or more	45,500	47,100	9,230	34,830	0	0	3,050	0	26

## **Rental Market Dynamics<sup>15</sup>**

Table A expands the analysis in rows 5-11 in Forward-Looking Table 4 into a full rental dynamics analysis by examining in more detail what happened to the units in each row. In particular, the “present in 2002” and “change in characteristics” columns (column D and E in the CINCH tables) are disaggregated into the following options: each of the other rent affordability columns (new columns *D* through *J*), owner-occupancy (new column *K*), and vacant or seasonal status (new column *L*). The remaining columns (columns F through K in the CINCH tables) are collapsed into a “Lost to stock” column (new column *M*). Table B does the same for the analysis of rows 5-11 in Backward-Looking Table 4, with column *M* being additions through new construction and column *N* being additions from other sources.<sup>16</sup> Because the Census Bureau put a cap on the rents it reported for Buffalo in 1994, we cannot distinguish between units in the low-rent, moderate-rent, high-rent, and very-high-rent categories, and therefore have collapsed these four categories into one category, low-to-very-high-rent units (column *J*).

Table A shows that there were 151,570 rental units in the Buffalo metropolitan area in 1994. In 2002, 49,360 of these units were no longer rental; 15,330 were owner-occupied, 23,760 were either vacant or being used seasonally, and 10,270 had been lost to the stock. Taken as a proportion of the units in 1994, movement into owner-occupancy was spread fairly evenly over the various rent categories; losses to the stock were concentrated among non-market and extremely-low-rent units.

Table B shows there were 145,680 rental units in the Buffalo metropolitan area in 2002, of which 40,600 were not rental units in 1994. The new units came from units that had been owner-occupied (21,330), units that had been vacant or in seasonal use (15,050), newly constructed units (3,870), and other additions (350). Most of the formerly owner-occupied units went to the extremely-low-rent and the very-low-rent categories.

Looking at both tables, we see that the overall number of rental units was approximately equal in 1994 and 2002. The number of extremely-low-rent and very-low-rent units also stayed equal at approximately 105,000 in 1994 and 2002.

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<sup>15</sup> This rental dynamics analysis differs from previous analyses in two ways: we do not adjust rents for bedroom sizes and we do not adjust area median family income for inflation.

<sup>16</sup> These tables use all the AHS observations for which we have relevant rent data, including observations where the Census Bureau provided an estimate of contract rent when the respondent did not provide an answer to the rent question. These observations are said to have “allocated” rents. The Watson-Eggers paper cited in footnote 1 studied the effect of allocations on rental dynamics analysis. They found that unallocated data show less dispersion. In their study of the six metropolitan areas surveyed as part of the national AHS, they found that the proportion of rental units that remain in the same rent category increased for all categories except non-market, where the proportion decreased slightly. There also appeared to be less movement of more than one rent category.

Components of Inventory Change and Rental Market Dynamics:  
Buffalo 1994–2002

**Table A: Forward-Looking Rental Dynamics Analysis**

	<i>C</i> Number in 1994	<i>D</i> Non- market in 2002	<i>E</i> Extremely low rent in 2002	<i>F</i> Very low rent in 2002	<i>J</i> Low to very high rent in 2002	<i>K</i> Owner- occupied in 2002	<i>L</i> Vacant or seasonal in 2002	<i>M</i> Lost to stock
Forward looking								
Non-market	26,240	8,800	4,020	2,100	470	2,970	4,870	3,010
Extremely low rent	57,070	4,710	26,460	4,000	1,530	4,620	11,410	4,350
Very low rent	48,790	1,940	15,010	18,430	1,170	4,900	4,850	2,490
Low to very high rent	19,470	110	990	7,590	4,900	2,830	2,620	430
Column sum	151,570	15,560	46,470	32,110	8,070	15,330	23,760	10,270

**Table B: Backward-Looking Rental Dynamics Analysis**

	<i>C</i> Number in 2002	<i>D</i> Non- market in 1994	<i>E</i> Extremely low rent in 1994	<i>F</i> Very low rent in 1994	<i>J</i> Low to very high rent in 1994	<i>K</i> Owner- occupied in 1994	<i>L</i> Vacant or seasonal in 1994	<i>M</i> New construc- tion	<i>N</i> Other additions
Backward looking									
Non-market	23,970	9,050	4,840	1,990	120	3,360	3,700	920	0
Extremely low rent	63,080	4,130	27,200	15,430	1,020	8,610	5,920	520	240
Very low rent	43,830	2,160	4,110	18,950	7,800	6,480	3,490	850	0
Low to very high rent	14,800	480	1,570	1,200	5,040	2,880	1,950	1,570	120
Column sum	145,680	15,810	37,720	37,580	13,970	21,330	15,050	3,870	350

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

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

- For each row, we tested whether the sum of possible outcomes (columns D through K in the forward-looking analysis and columns D through I in the backward-looking analysis) equaled the number of units present in the base year. In every case, equality was achieved except for differences created by rounding.
- Throughout the tables, various sets of rows are related to each other. For example, the year-built rows (13-23) 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, equality was achieved except for differences created by 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. We have footnoted two places where our coding does not seem to produce the same results as the published estimates. We observed that the correspondence between the CINCH and published estimates were closer in the slower growing metropolitan areas. We also noticed that the CINCH weighting tends to underestimate the number of units built since 1989 and the number of Hispanic households.

## ***Appendix B – Weighting***

CINCH separates the AHS samples in 1994 and 2002 into three components: units that exist and are part of the housing stock in both years (SAMES), units that are part of the 1994 housing stock but are not part of the 2002 housing stock (LOSSES), and units that are not part of the 1994 housing stock but are part of the 2002 housing stock (ADDITIONS). ADDITIONS are split into NEW CONSTRUCTION and RECOVERIES (structures that existed in 1994 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 1994 and those ADDITIONS that were interviewed in 2002.

For the forward-looking analysis, we started with the AHS pure weights and used the AHS weighted count in 1994 of SAMES to create weights for the interviewed SAMES. We used the AHS weighted count in 1994 of LOSSES to create weights for interviewed LOSSES. We then adjusted the weights of SAMES and LOSSES to equal the AHS published totals for occupied units, vacant units, and seasonal units in 1994.

For the backward-looking analysis, we started with the AHS pure weights and used the AHS weighted count in 2002 of SAMES to create weights for the interviewed SAMES. We used the AHS weighted counts in 2002 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 occupied units, vacant units, and seasonal units in 2002.

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