American Housing Survey

# Components of Inventory Change And Rental Dynamics: Atlanta 1996-2004

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

## *Overview*

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

This report focuses on the Atlanta 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

[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 Atlanta 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 Atlanta counted 1,306,300 occupied units (row 2, column B, forward-looking Table 1); the 2004 AHS report counted 1,595,800 occupied units (row 2, column B, backward-looking Table 1).

- Column C gives the CINCH estimate of the number of units that satisfy two conditions: (a) being part of the housing stock in the relevant year (1996 for the forward-looking tables and 2004 for the backward-looking tables), and (b) satisfying the condition in column A. CINCH uses different weights than those used in preparing the published AHS reports. Therefore, CINCH estimates can differ from AHS estimates for particular subsets of the housing stock. As explained in the appendix, the weights were created to match AHS published totals for rows 2 through 4 of Table 1 and rows 2 and 4 of Table 4. This perfect match will not be true of other rows.[2]

- Column D is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, and (b) continue to belong to the subset defined by column A. For example, column D of row 2 of forward-

[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 1,124,200 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 137,000 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, 1,800 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, 3,700 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, 3,200 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, 23,500 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 Atlanta, 1,800 occupied units were lost because of damage or similar cause.

[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 11,100 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, 700 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, 3,600 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, 303,100 units were newly constructed.

- Column J is the CINCH estimate of the number of units from column C that were added by 2004 by the recovery of units that had been temporarily lost to the housing stock because occupancy was prohibited in 1996, or the interior of the unit was exposed to the elements, or for reasons "not classified." The 2004 occupied housing stock includes 6,100 recovered units.

- Column K includes units added by the Census Bureau as sample adjustments. Sample adjustments represent 1,100 occupied units in 2004.

[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 Atlanta, 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 Atlanta AHS public use file, the Census Bureau reported all units in structures with 4 or more stories in row 40 and reported no units in rows 41 and 42. The published reports contain matching data for row 37 only.

[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.

[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]

[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<br>Characteristics | B<br>Published Numbers | C<br>Present in 95 | D<br>95 units present in 2004 | E<br>Changed in characteristics | F<br>95 units affected by conversion /merger | G<br>95 mobile homes moved out | H<br>95 units changed to nonresidential use | I<br>95 units lost through demolition or disaster | J<br>95 units badly damaged or condemned | K<br>95 units lost in other ways | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Total** | 1,421,100 | 1,421,000 | 1,365,300 | 0 | 2,300 | 4,500 | 3,600 | 28,400 | 2,700 | 14,100 | 1 |
| | | | | | | | | | | | | |
| | **Occupancy Status** | | | | | | | | | | | |
| 2 | Occupied | 1,306,300 | 1,306,300 | 1,124,200 | 137,000 | 1,800 | 3,700 | 3,200 | 23,500 | 1,800 | 11,100 | 2 |
| 3 | Vacant | 111,600 | 111,600 | 20,200 | 80,800 | 400 | 900 | 400 | 4,900 | 900 | 3,100 | 3 |
| 4 | Seasonal | 3,100 | 3,100 | 0 | 3,100 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| | | | | | | | | | | | | |
| | **Units in Structure** | | | | | | | | | | | |
| 5 | 1, detached | 908,200 | 919,900 | 893,800 | 0 | 500 | 2,700 | 2,700 | 13,300 | 1,400 | 5,500 | 5 |
| 6 | 1, attached | 41,900 | 45,200 | 43,800 | 0 | 0 | 0 | 0 | 900 | 0 | 400 | 6 |
| 7 | 2 to 4 | 99,800 | 102,300 | 97,600 | 0 | 500 | 0 | 0 | 3,700 | 0 | 500 | 7 |
| 8 | 5 to 9 | 104,000 | 105,300 | 97,100 | 0 | 1,400 | 0 | 500 | 5,500 | 900 | 0 | 8 |
| 9 | 10 to 19 | 113,700 | 114,600 | 112,300 | 0 | 0 | 0 | 0 | 1,400 | 0 | 900 | 9 |
| 10 | 20 to 49 | 63,700 | 88,800 | 82,900 | 0 | 0 | 0 | 0 | 2,300 | 500 | 3,200 | 10 |
| 11 | 50 or more | 25,800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 12 | Mobile Home/Trailer | 64,000 | 45,000 | 37,700 | 0 | 0 | 1,800 | 500 | 1,400 | 0 | 3,700 | 12 |
| | | | | | | | | | | | | |
| | **Year Built** | | | | | | | | | | | |
| 15 | 1990-1996 | 227,500 | 224,300 | 218,000 | 0 | 0 | 0 | 500 | 2,200 | 0 | 3,600 | 15 |
| 16 | 1985-1989 | 231,400 | 223,600 | 220,300 | 0 | 900 | 500 | 0 | 900 | 0 | 900 | 16 |
| 17 | 1980-1984 | 145,300 | 153,100 | 149,800 | 0 | 0 | 0 | 500 | 1,400 | 0 | 1,400 | 17 |
| 18 | 1970-1979 | 406,300 | 402,100 | 388,800 | 0 | 500 | 900 | 1,400 | 7,400 | 500 | 2,800 | 18 |
| 19 | 1960-1969 | 183,200 | 182,400 | 173,400 | 0 | 0 | 1,800 | 500 | 5,000 | 900 | 900 | 19 |
| 20 | 1950-1959 | 106,100 | 110,500 | 101,900 | 0 | 0 | 900 | 500 | 4,100 | 900 | 2,300 | 20 |
| 21 | 1940-1949 | 51,800 | 52,800 | 47,800 | 0 | 400 | 0 | 400 | 4,100 | 0 | 0 | 21 |
| 22 | 1930-1939 | 19,400 | 20,600 | 17,400 | 0 | 0 | 0 | 0 | 900 | 500 | 1,800 | 22 |
| 23 | 1920-1929 | 19,600 | 20,200 | 17,900 | 0 | 500 | 500 | 0 | 1,400 | 0 | 0 | 23 |
| 24 | 1919 or earlier | 30,500 | 31,300 | 30,000 | 0 | 0 | 0 | 0 | 900 | 0 | 500 | 24 |
| | | | | | | | | | | | | |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 95 | D<br>95 units present in 2004 | E<br>Changed in characteristics | F<br>95 units affected by conversion /merger | G<br>95 mobile homes moved out | H<br>95 units changed to nonresidential use | I<br>95 units lost through demolition or disaster | J<br>95 units badly damaged or condemned | K<br>95 units lost in other ways | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Rooms** | | | | | | | | | | | |
| 25 | 1 – 4 rooms | 317,200 | 313,000 | 193,900 | 97,200 | 0 | 1,800 | 1,800 | 10,500 | 1,400 | 6,400 | 25 |
| 26 | 5 rooms | 305,400 | 305,300 | 126,600 | 160,000 | 1,400 | 1,400 | 1,400 | 11,000 | 400 | 3,200 | 26 |
| 27 | 6 rooms | 323,200 | 313,900 | 152,200 | 154,300 | 500 | 500 | 500 | 3,200 | 500 | 2,300 | 27 |
| 28 | 7 rooms | 189,800 | 196,700 | 65,000 | 129,500 | 0 | 500 | 0 | 1,400 | 0 | 500 | 28 |
| 29 | 8 rooms | 146,700 | 152,900 | 44,500 | 105,700 | 0 | 400 | 0 | 900 | 500 | 900 | 29 |
| 30 | 9 rooms | 72,600 | 72,600 | 10,300 | 60,500 | 400 | 0 | 0 | 900 | 0 | 500 | 30 |
| 31 | 10 rooms or more | 66,300 | 66,600 | 23,200 | 42,400 | 0 | 0 | 0 | 500 | 0 | 500 | 31 |
| | | | | | | | | | | | | |
| | **Bedrooms** | | | | | | | | | | | |
| 32 | None | 6,700 | 7,700 | 1,700 | 5,600 | 0 | 0 | 0 | 400 | 0 | 0 | 32 |
| 33 | 1 | 151,300 | 150,200 | 103,700 | 40,500 | 0 | 400 | 0 | 3,700 | 0 | 1,800 | 33 |
| 34 | 2 | 379,200 | 376,100 | 246,500 | 100,400 | 900 | 1,800 | 2,300 | 13,300 | 1,400 | 9,600 | 34 |
| 35 | 3 | 599,200 | 596,400 | 448,200 | 131,200 | 900 | 1,800 | 1,400 | 9,200 | 1,400 | 2,300 | 35 |
| 36 | 4 or more | 284,600 | 290,500 | 232,500 | 54,800 | 400 | 400 | 0 | 1,800 | 0 | 400 | 36 |
| | | | | | | | | | | | | |
| 37 | **Multiunit Structures** | 407,000 | 410,900 | 389,900 | 0 | 1,800 | 0 | 500 | 12,800 | 1,300 | 4,600 | 37 |
| | **Stories in Structures** | | | | | | | | | | | |
| 38 | 1 | NA | 44,000 | 41,700 | 0 | 0 | 0 | 0 | 1,900 | 0 | 500 | 38 |
| 39 | 2 | NA | 218,000 | 204,300 | 0 | 1,800 | 0 | 500 | 8,700 | 900 | 1,900 | 39 |
| 40 | 3 | NA | 148,900 | 144,000 | 0 | 0 | 0 | 0 | 2,300 | 500 | 2,300 | 40 |
| 41 | 4 to 6 | NA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 |
| 42 | 7 or more | NA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| | | | | | | | | | | | | |
| | **Metro Status** | | | | | | | | | | | |
| 43 | In central cities | NA | 179,100 | 165,100 | 0 | 900 | 0 | 0 | 10,000 | 900 | 2,300 | 43 |
| 44 | In suburbs | NA | 1,241,900 | 1,200,200 | 0 | 1,400 | 4,500 | 3,600 | 18,400 | 1,800 | 11,900 | 44 |
| | | | | | | | | | | | | |
| | **Mover Status** | | | | | | | | | | | |
| 45 | Moved in last 2 years | NA | 345,100 | 95,300 | 236,000 | 900 | 0 | 900 | 6,000 | 0 | 6,000 | 45 |
| 46 | Not a Recent Mover | NA | 961,200 | 929,900 | 0 | 900 | 3,700 | 2,300 | 17,500 | 1,800 | 5,000 | 46 |
| | | | | | | | | | | | | |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 95 | D<br>95 units present in 2004 | E<br>Changed in characteristics | F<br>95 units affected by conversion /merger | G<br>95 mobile homes moved out | H<br>95 units changed to nonresidential use | I<br>95 units lost through demolition or disaster | J<br>95 units badly damaged or condemned | K<br>95 units lost in other ways | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Occupied Units** | 1,306,300 | 1,306,300 | 1,124,200 | 137,000 | 1,800 | 3,700 | 3,200 | 23,500 | 1,800 | 11,100 | 1 |
| | | | | | | | | | | | | |
| | **Kitchen** | | | | | | | | | | | |
| 2 | With complete kitchen | 1,294,600 | 1,298,200 | 1,101,700 | 152,800 | 1,800 | 3,200 | 3,200 | 23,100 | 1,400 | 11,100 | 2 |
| 3 | Lacking complete kitchen facilities | 11,700 | 8,100 | 0 | 6,700 | 0 | 500 | 0 | 500 | 500 | 0 | 3 |
| | **Plumbing** | | | | | | | | | | | |
| 4 | With all plumbing facilities | 1,299,600 | 1,300,500 | 1,112,100 | 143,700 | 1,800 | 3,700 | 3,200 | 23,500 | 1,800 | 10,600 | 4 |
| 5 | Lack some plumbing | 0 | 5,800 | 0 | 5,400 | 0 | 0 | 0 | 0 | 0 | 500 | 5 |
| 6 | No hot piped water | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 7 | No bathtub/shower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 8 | No flush toilet | 6,800 | 5,800 | 0 | 5,400 | 0 | 0 | 0 | 0 | 0 | 500 | 8 |
| | | | | | | | | | | | | |
| | **Water** | | | | | | | | | | | |
| 10 | Public/private water | 1,251,200 | 1,245,500 | 1,067,600 | 136,500 | 1,800 | 2,700 | 2,300 | 22,100 | 1,800 | 10,600 | 10 |
| 11 | Well | 52,800 | 59,400 | 34,700 | 21,100 | 0 | 900 | 900 | 1,400 | 0 | 500 | 11 |
| 12 | Other water source | 2,300 | 1,400 | 400 | 900 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| | **Sewer** | | | | | | | | | | | |
| 13 | Public sewer | 956,000 | 950,700 | 803,500 | 117,300 | 1,400 | 500 | 900 | 17,100 | 1,800 | 8,300 | 13 |
| 14 | Septic tank/cesspool | 350,300 | 355,600 | 230,000 | 110,400 | 500 | 3,200 | 2,300 | 6,400 | 0 | 2,800 | 14 |
| 15 | Other or none | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| | | | | | | | | | | | | |
| 16 | **Severe Problems** | 18,600 | 21,600 | 0 | 20,700 | 0 | 0 | 0 | 500 | 0 | 500 | 16 |
| 17 | Plumbing | 6,800 | 5,800 | 0 | 5,400 | 0 | 0 | 0 | 0 | 0 | 500 | 17 |
| 18 | Heating | 8,000 | 13,500 | 0 | 13,500 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 19 | Electric | 1,000 | 1,400 | 0 | 1,400 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| 20 | Upkeep | 3,600 | 1,800 | 0 | 1,400 | 0 | 0 | 0 | 500 | 0 | 0 | 20 |
| 21 | Hallways | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| | | | | | | | | | | | | |
| 22 | **Moderate problems** | 69,200 | 61,300 | 3,100 | 52,600 | 0 | 500 | 500 | 2,800 | 1,400 | 500 | 22 |
| 23 | Plumbing | 7,800 | 8,600 | 500 | 7,700 | 0 | 0 | 0 | 500 | 0 | 0 | 23 |
| 24 | Heating | 17,200 | 20,300 | 400 | 17,500 | 0 | 0 | 500 | 1,400 | 500 | 0 | 24 |
| 25 | Kitchen | 10,700 | 8,100 | 0 | 6,700 | 0 | 500 | 0 | 500 | 500 | 0 | 25 |
| 26 | Upkeep | 35,800 | 32,900 | 500 | 29,700 | 0 | 0 | 500 | 1,400 | 500 | 500 | 26 |
| 27 | Hallways | 1,800 | 500 | 0 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 95 | D<br>95 units present in 2004 | E<br>Changed in characteristics | F<br>95 units affected by conversion /merger | G<br>95 mobile homes moved out | H<br>95 units changed to nonresidential use | I<br>95 units lost through demolition or disaster | J<br>95 units badly damaged or condemned | K<br>95 units lost in other ways | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Occupied units** | 1,306,300 | 1,306,300 | 1,124,200 | 137,000 | 1,800 | 3,700 | 3,200 | 23,500 | 1,800 | 11,100 | 1 |
| | | | | | | | | | | | | |
| | **Age of Householder** | | | | | | | | | | | |
| 2 | Under 65 | 1,134,500 | 1,125,300 | 890,300 | 198,500 | 1,800 | 1,800 | 2,800 | 18,500 | 1,400 | 10,100 | 2 |
| 3 | 65 or older | 171,800 | 181,000 | 90,800 | 81,500 | 0 | 1,800 | 500 | 5,000 | 500 | 900 | 3 |
| | | | | | | | | | | | | |
| | **Children** | | | | | | | | | | | |
| 4 | Some | 494,400 | 506,800 | 245,900 | 246,100 | 0 | 500 | 1,800 | 8,300 | 900 | 3,200 | 4 |
| 5 | None | 811,900 | 799,500 | 521,500 | 247,600 | 1,800 | 3,200 | 1,400 | 15,200 | 900 | 7,800 | 5 |
| | | | | | | | | | | | | |
| | **Race/Origin of Householder** | | | | | | | | | | | |
| 6 | White | 932,200 | 928,700 | 696,200 | 201,700 | 1,400 | 3,700 | 3,200 | 12,400 | 500 | 9,700 | 6 |
| 7 | Hispanic | 24,200 | 24,000 | 5,400 | 16,800 | 0 | 0 | 0 | 500 | 0 | 1,400 | 7 |
| 8 | NonHispanic | 907,900 | 904,700 | 639,400 | 236,400 | 1,400 | 3,700 | 3,200 | 12,000 | 500 | 8,300 | 8 |
| 9 | Black | 324,600 | 328,500 | 223,100 | 91,600 | 500 | 0 | 0 | 10,600 | 1,400 | 1,400 | 9 |
| 10 | Other | 49,600 | 49,100 | 9,700 | 38,900 | 0 | 0 | 0 | 500 | 0 | 0 | 10 |
| 11 | Total Hispanics | 41,600 | 40,500 | 10,300 | 28,300 | 0 | 0 | 0 | 500 | 0 | 1,400 | 11 |
| | | | | | | | | | | | | |
| | **Income Source** | | | | | | | | | | | |
| 12 | Wages and salaries | 1,104,900 | 1,103,600 | 838,100 | 231,000 | 1,400 | 1,800 | 2,800 | 16,600 | 1,400 | 10,600 | 12 |
| 13 | Welfare or SSI | 259,400 | 273,600 | 116,700 | 144,500 | 500 | 1,800 | 500 | 7,800 | 500 | 1,400 | 13 |
| 14 | Social security or pension | 58,700 | 64,700 | 3,600 | 54,200 | 0 | 500 | 500 | 5,100 | 0 | 900 | 14 |
| | | | | | | | | | | | | |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 95 | D<br>95 units present in 2004 | E<br>Changed in characteristics | F<br>95 units affected by conversion /merger | G<br>95 mobile homes moved out | H<br>95 units changed to nonresidential use | I<br>95 units lost through demolition or disaster | J<br>95 units badly damaged or condemned | K<br>95 units lost in other ways | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Occupied units** | 1,306,300 | 1,306,300 | 1,124,200 | 137,000 | 1,800 | 3,700 | 3,200 | 23,500 | 1,800 | 11,100 | 1 |
| | | | | | | | | | | | | |
| | **Tenure** | | | | | | | | | | | |
| 2 | Owner occupied | 832,200 | 832,200 | 696,300 | 116,200 | 500 | 3,200 | 2,700 | 7,800 | 500 | 5,000 | 2 |
| 3 | Percent own occpd | 63.7% | 63.7% | | | | | | | | | 3 |
| 4 | Renter occupied | 474,100 | 474,100 | 279,400 | 169,200 | 1,400 | 500 | 500 | 15,700 | 1,400 | 6,000 | 4 |
| | | | | | | | | | | | | |
| | **Renter Monthly Housing Costs** | | | | | | | | | | | |
| 5 | Less than $350 | 48,900 | 53,900 | 22,600 | 28,000 | 0 | 0 | 0 | 3,200 | 0 | 0 | 5 |
| 6 | $350 to $599 | 131,500 | 129,200 | 22,500 | 94,200 | 500 | 500 | 500 | 5,600 | 1,400 | 4,200 | 6 |
| 7 | $600 to $799 | 168,300 | 174,500 | 50,600 | 117,300 | 900 | 0 | 0 | 4,600 | 0 | 900 | 7 |
| 8 | $800 to $1,249 | 100,100 | 102,100 | 32,600 | 67,700 | 0 | 0 | 0 | 900 | 0 | 900 | 8 |
| 9 | $1,250 or more | 10,200 | 1,800 | 500 | 1,400 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 10 | No cash rent | 15,000 | 12,700 | 1,400 | 9,900 | 0 | 0 | 0 | 1,400 | 0 | 0 | 10 |
| | | | | | | | | | | | | |
| | **Renter Hsd Income** | | | | | | | | | | | |
| 11 | Less than $15,000 | 104,800 | 107,300 | 27,600 | 73,700 | 0 | 0 | 0 | 4,600 | 0 | 1,400 | 11 |
| 12 | $15,000 to $29,999 | 147,700 | 148,700 | 22,200 | 117,700 | 900 | 500 | 0 | 3,700 | 900 | 2,800 | 12 |
| 13 | $30,000 to $49,999 | 120,000 | 115,900 | 25,500 | 82,100 | 0 | 0 | 500 | 6,000 | 0 | 1,900 | 13 |
| 14 | $50,000 to $99,999 | 86,200 | 92,300 | 11,800 | 78,700 | 0 | 0 | 0 | 1,400 | 500 | 0 | 14 |
| 15 | $100,000 or more | 15,300 | 10,000 | 500 | 9,000 | 500 | 0 | 0 | 0 | 0 | 0 | 15 |
| | | | | | | | | | | | | |
| | **Owner Monthly Housing Costs** | | | | | | | | | | | |
| 16 | Less than $350 | 180,000 | 186,900 | 64,500 | 111,900 | 0 | 1,800 | 1,400 | 5,900 | 500 | 900 | 16 |
| 17 | $350 to $599 | 110,900 | 112,100 | 24,800 | 82,700 | 0 | 500 | 900 | 900 | 0 | 2,300 | 17 |
| 18 | $600 to $799 | 123,200 | 124,900 | 13,400 | 110,100 | 0 | 0 | 0 | 0 | 0 | 1,400 | 18 |
| 19 | $800 to $1,249 | 256,100 | 251,200 | 70,900 | 177,500 | 500 | 900 | 500 | 500 | 0 | 500 | 19 |
| 20 | $1,250 or more | 162,000 | 157,100 | 98,000 | 58,600 | 0 | 0 | 0 | 500 | 0 | 0 | 20 |
| | | | | | | | | | | | | |
| | **Owner Hsd Income** | | | | | | | | | | | |
| 21 | Less than $15,000 | 68,300 | 67,900 | 12,500 | 49,900 | 0 | 900 | 500 | 2,700 | 500 | 900 | 21 |
| 22 | $15,000 to $29,999 | 128,700 | 124,700 | 21,000 | 98,300 | 0 | 500 | 1,400 | 2,300 | 0 | 1,400 | 22 |
| 23 | $30,000 to $49,999 | 180,800 | 176,800 | 34,100 | 139,100 | 0 | 1,400 | 0 | 900 | 0 | 1,400 | 23 |
| 24 | $50,000 to $99,999 | 306,200 | 309,600 | 114,100 | 190,900 | 500 | 500 | 900 | 1,400 | 0 | 1,400 | 24 |
| 25 | $100,000 or more | 148,200 | 153,100 | 75,600 | 77,000 | 0 | 0 | 0 | 500 | 0 | 0 | 25 |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 2004 | D<br>04 units present in 95 | E<br>Changed in characteristics | G<br>04 mobile homes moved in | H<br>04 units derived from nonresidential use | I<br>04 units added through new construction | J<br>04 units added from temporary losses | K<br>04 units added by other means | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Total** | 1,802,800 | 1,802,800 | 1,440,500 | 0 | 700 | 4,200 | 348,200 | 7,700 | 1,400 | 1 |
| | | | | | | | | | | | |
| | **Occupancy Status** | | | | | | | | | | |
| 2 | Occupied | 1,595,800 | 1,595,800 | 1,192,300 | 89,000 | 700 | 3,600 | 303,100 | 6,100 | 1,100 | 2 |
| 3 | Vacant | 203,200 | 203,200 | 21,200 | 135,200 | 0 | 700 | 44,100 | 1,700 | 300 | 3 |
| 4 | Seasonal | 3,800 | 3,800 | 0 | 2,700 | 0 | 0 | 1,100 | 0 | 0 | 4 |
| | | | | | | | | | | | |
| | **Units in Structure** | | | | | | | | | | |
| 5 | 1, detached | 1,225,800 | 1,246,500 | 986,200 | 0 | 0 | 2,800 | 253,600 | 3,500 | 400 | 5 |
| 6 | 1, attached | 108,900 | 96,100 | 59,700 | 0 | 0 | 700 | 33,900 | 1,100 | 700 | 6 |
| 7 | 2 to 4 | 68,500 | 72,400 | 69,300 | 0 | 0 | 0 | 2,700 | 0 | 400 | 7 |
| 8 | 5 to 9 | 105,900 | 112,100 | 100,600 | 0 | 0 | 0 | 9,500 | 2,100 | 0 | 8 |
| 9 | 10 to 19 | 125,300 | 132,100 | 117,400 | 0 | 0 | 0 | 13,600 | 1,000 | 0 | 9 |
| 10 | 20 to 49 | 68,600 | 63,200 | 41,200 | 0 | 0 | 0 | 22,100 | 0 | 0 | 10 |
| 11 | 50 or more | 32,100 | 35,600 | 25,400 | 0 | 0 | 400 | 9,900 | 0 | 0 | 11 |
| 12 | Mobile Home/Trailer | 67,600 | 44,800 | 40,800 | 0 | 700 | 300 | 3,000 | 0 | 0 | 12 |
| | | | | | | | | | | | |
| | **Year Built** | | | | | | | | | | |
| 13 | 2000-2004 | 280,000 | 218,500 | 0 | 0 | 0 | 0 | 217,700 | 700 | 0 | 13 |
| 14 | 1995-1999 | 208,100 | 179,900 | 81,600 | 0 | 700 | 0 | 96,900 | 700 | 0 | 14 |
| 15 | 1990-1994 | 201,000 | 199,200 | 166,800 | 0 | 0 | 0 | 32,300 | 0 | 0 | 15 |
| 16 | 1985-1989 | 234,800 | 256,600 | 254,800 | 0 | 0 | 700 | 0 | 1,100 | 0 | 16 |
| 17 | 1980-1984 | 166,800 | 180,200 | 178,400 | 0 | 0 | 400 | 0 | 1,400 | 0 | 17 |
| 18 | 1970-1979 | 319,900 | 344,900 | 342,200 | 0 | 0 | 700 | 600 | 1,400 | 0 | 18 |
| 19 | 1960-1969 | 181,000 | 192,200 | 190,100 | 0 | 0 | 700 | 300 | 1,100 | 0 | 19 |
| 20 | 1950-1959 | 107,600 | 116,300 | 114,200 | 0 | 0 | 700 | 300 | 400 | 700 | 20 |
| 21 | 1940-1949 | 52,100 | 56,300 | 54,200 | 0 | 0 | 700 | 0 | 700 | 700 | 21 |
| 22 | 1930-1939 | 18,800 | 21,200 | 20,500 | 0 | 0 | 400 | 0 | 300 | 0 | 22 |
| 23 | 1920-1929 | 17,100 | 19,300 | 19,300 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 24 | 1919 or earlier | 15,500 | 18,300 | 18,300 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| | | | | | | | | | | | |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 2004 | D<br>04 units present in 95 | E<br>Changed in characteristics | G<br>04 mobile homes moved in | H<br>04 units derived from nonresidential use | I<br>04 units added through new construction | J<br>04 units added from temporary losses | K<br>04 units added by other means | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Rooms** | | | | | | | | | | |
| 25 | 1 – 4 rooms | 330,800 | 331,000 | 199,700 | 80,500 | 0 | 1,800 | 44,800 | 3,200 | 1,100 | 25 |
| 26 | 5 rooms | 349,200 | 344,800 | 133,800 | 147,500 | 0 | 700 | 60,700 | 2,100 | 0 | 26 |
| 27 | 6 rooms | 438,600 | 446,400 | 161,300 | 208,400 | 700 | 300 | 74,200 | 1,100 | 400 | 27 |
| 28 | 7 rooms | 266,100 | 271,400 | 69,800 | 147,700 | 0 | 1,100 | 52,100 | 700 | 0 | 28 |
| 29 | 8 rooms | 171,300 | 169,600 | 47,400 | 80,400 | 0 | 0 | 41,500 | 400 | 0 | 29 |
| 30 | 9 rooms | 97,300 | 93,900 | 11,000 | 50,500 | 0 | 400 | 31,700 | 400 | 0 | 30 |
| 31 | 10 rooms or more | 149,400 | 145,600 | 25,000 | 77,400 | 0 | 0 | 43,200 | 0 | 0 | 31 |
| | | | | | | | | | | | |
| | **Bedrooms** | | | | | | | | | | |
| 32 | None | 4,900 | 5,700 | 1,400 | 2,800 | 0 | 400 | 800 | 0 | 300 | 32 |
| 33 | 1 | 157,400 | 157,200 | 107,700 | 25,300 | 0 | 700 | 23,100 | 0 | 400 | 33 |
| 34 | 2 | 398,000 | 396,000 | 255,400 | 78,000 | 0 | 1,800 | 55,500 | 4,600 | 700 | 34 |
| 35 | 3 | 742,400 | 748,400 | 477,500 | 135,200 | 700 | 700 | 131,800 | 2,500 | 0 | 35 |
| 36 | 4 or more | 500,100 | 495,600 | 249,000 | 108,300 | 0 | 700 | 136,900 | 700 | 0 | 36 |
| | | | | | | | | | | | |
| 37 | **Multiunit Structures** | 400,400 | 415,400 | 353,800 | 0 | 0 | 400 | 57,800 | 3,100 | 400 | 37 |
| | **Stories in Structures** | | | | | | | | | | |
| 38 | 1 | NA | 45,100 | 43,100 | 0 | 0 | 0 | 2,000 | 0 | 0 | 38 |
| 39 | 2 | NA | 200,300 | 184,300 | 0 | 0 | 0 | 13,600 | 2,100 | 400 | 39 |
| 40 | 3 | NA | 127,000 | 101,000 | 0 | 0 | 0 | 25,000 | 1,100 | 0 | 40 |
| 41 | 4 to 6 | NA | 29,900 | 13,600 | 0 | 0 | 400 | 15,900 | 0 | 0 | 41 |
| 42 | 7 or more | NA | 13,100 | 11,800 | 0 | 0 | 0 | 1,300 | 0 | 0 | 42 |
| | | | | | | | | | | | |
| | **Metro Status** | | | | | | | | | | |
| 43 | In central cities | NA | 198,800 | 174,000 | 0 | 0 | 1,800 | 19,200 | 3,500 | 400 | 43 |
| 44 | In suburbs | NA | 1,604,000 | 1,266,500 | 0 | 700 | 2,500 | 329,000 | 4,200 | 1,100 | 44 |
| | | | | | | | | | | | |
| | **Mover Status** | | | | | | | | | | |
| 45 | Moved in last 2 years | NA | 389,900 | 90,900 | 185,100 | 0 | 400 | 109,800 | 2,800 | 700 | 45 |
| 46 | Not a Recent Mover | NA | 1,205,900 | 728,900 | 276,300 | 700 | 3,200 | 193,200 | 3,200 | 400 | 46 |
| | | | | | | | | | | | |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 2004 | D<br>04 units present in 95 | E<br>Changed in characteristics | G<br>04 mobile homes moved in | H<br>04 units derived from nonresidential use | I<br>04 units added through new construction | J<br>04 units added from temporary losses | K<br>04 units added by other means | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Occupied Units** | 1,595,800 | 1,595,800 | 1,192,300 | 89,000 | 700 | 3,600 | 303,100 | 6,100 | 1,100 | 1 |
| | | | | | | | | | | | |
| | **Kitchen** | | | | | | | | | | |
| 2 | With complete kitchen | 1,574,800 | 1,574,900 | 1,169,500 | 94,300 | 700 | 3,200 | 300,400 | 6,100 | 700 | 2 |
| 3 | Lacking complete kitchen facilities | 21,000 | 20,900 | 0 | 17,600 | 0 | 400 | 2,600 | 0 | 400 | 3 |
| | **Plumbing** | | | | | | | | | | |
| 4 | With all plumbing facilities | 1,587,300 | 1,586,900 | 1,179,400 | 93,300 | 700 | 3,600 | 302,700 | 6,100 | 1,100 | 4 |
| 5 | Lack some plumbing | 8,500 | 8,900 | 0 | 8,500 | 0 | 0 | 300 | 0 | 0 | 5 |
| 6 | No hot piped water | 800 | 900 | 0 | 900 | 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 | 7,700 | 7,900 | 0 | 7,600 | 0 | 0 | 300 | 0 | 0 | 9 |
| | | | | | | | | | | | |
| | **Water** | | | | | | | | | | |
| 10 | Public/private water | 1,552,100 | 1,544,600 | 1,132,500 | 105,400 | 700 | 3,600 | 295,200 | 6,100 | 1,100 | 10 |
| 11 | Well | 42,100 | 49,300 | 36,300 | 5,200 | 0 | 0 | 7,800 | 0 | 0 | 11 |
| 12 | Other water source | 1,600 | 1,900 | 500 | 1,400 | 0 | 0 | 0 | 0 | 0 | 12 |
| | **Sewer** | | | | | | | | | | |
| 13 | Public sewer | 1,264,300 | 1,256,300 | 850,000 | 161,200 | 700 | 2,900 | 234,800 | 5,700 | 1,100 | 13 |
| 14 | Septic tank/cesspool | 331,500 | 339,500 | 245,000 | 25,200 | 0 | 700 | 68,200 | 400 | 0 | 14 |
| 15 | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| | | | | | | | | | | | |
| 16 | **Severe Problems** | 16,200 | 17,300 | 0 | 16,700 | 0 | 0 | 700 | 0 | 0 | 16 |
| 17 | Plumbing | 8,500 | 8,900 | 0 | 8,500 | 0 | 0 | 300 | 0 | 0 | 17 |
| 18 | Heating | 6,200 | 6,500 | 0 | 6,200 | 0 | 0 | 300 | 0 | 0 | 18 |
| 19 | Electric | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| 20 | Upkeep | 2,000 | 2,400 | 0 | 2,400 | 0 | 0 | 0 | 0 | 0 | 20 |
| 21 | Hallways | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| | | | | | | | | | | | |
| 22 | **Moderate problems** | 46,000 | 46,800 | 3,300 | 37,100 | 0 | 400 | 5,300 | 400 | 400 | 22 |
| 23 | Plumbing | 5,000 | 7,100 | 500 | 6,700 | 0 | 0 | 0 | 0 | 0 | 23 |
| 24 | Heating | 5,400 | 5,700 | 500 | 5,300 | 0 | 0 | 0 | 0 | 0 | 24 |
| 25 | Kitchen | 20,200 | 20,900 | 0 | 17,600 | 0 | 400 | 2,600 | 0 | 400 | 25 |
| 26 | Upkeep | 13,500 | 14,900 | 500 | 12,400 | 0 | 0 | 2,000 | 0 | 0 | 26 |
| 27 | Hallways | 4,500 | 5,300 | 0 | 4,300 | 0 | 0 | 700 | 400 | 0 | 27 |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 2004 | D<br>04 units present in 95 | E<br>Changed in characteristics | G<br>04 mobile homes moved in | H<br>04 units derived from nonresidential use | I<br>04 units added through new construction | J<br>04 units added from temporary losses | K<br>04 units added by other means | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Occupied units** | 1,595,800 | 1,595,800 | 1,192,300 | 89,000 | 700 | 3,600 | 303,100 | 6,100 | 1,100 | 1 |
| | | | | | | | | | | | |
| | **Age of Householder** | | | | | | | | | | |
| 2 | Under 65 | 1,400,000 | 1,384,200 | 941,800 | 144,400 | 400 | 2,900 | 288,000 | 6,100 | 700 | 2 |
| 3 | 65 or older | 195,800 | 211,600 | 97,300 | 97,700 | 400 | 700 | 15,100 | 0 | 400 | 3 |
| | | | | | | | | | | | |
| | **Children** | | | | | | | | | | |
| 4 | Some | 598,500 | 601,300 | 261,100 | 197,700 | 0 | 1,100 | 138,200 | 3,200 | 0 | 4 |
| 5 | None | 997,300 | 994,500 | 553,600 | 268,800 | 700 | 2,500 | 164,900 | 2,900 | 1,100 | 5 |
| | | | | | | | | | | | |
| | **Race/Origin of Householder** | | | | | | | | | | |
| 6 | White | 1,036,000 | 1,049,300 | 741,900 | 114,100 | 700 | 1,100 | 189,800 | 1,100 | 700 | 6 |
| 7 | Hispanic | 88,700 | 91,900 | 5,800 | 76,400 | 0 | 0 | 9,400 | 400 | 0 | 7 |
| 8 | Non-Hispanic | 947,300 | 957,400 | 681,400 | 92,300 | 700 | 1,100 | 180,400 | 700 | 700 | 8 |
| 9 | Black | 502,100 | 487,100 | 234,700 | 142,000 | 0 | 2,500 | 102,800 | 4,600 | 400 | 9 |
| 10 | Other | 57,800 | 59,400 | 11,800 | 36,900 | 0 | 0 | 10,400 | 400 | 0 | 10 |
| 11 | Total Hispanics | 102,600 | 105,800 | 11,000 | 82,200 | 0 | 0 | 12,300 | 400 | 0 | 11 |
| | | | | | | | | | | | |
| | **Income Source** | | | | | | | | | | |
| 12 | Wages and salaries | 1,369,000 | 1,360,900 | 830,300 | 241,800 | 700 | 2,900 | 278,100 | 6,100 | 1,100 | 12 |
| 13 | Welfare or SSI | 268,900 | 284,500 | 125,200 | 126,300 | 400 | 700 | 32,000 | 0 | 0 | 13 |
| 14 | Social security or pension | 52,500 | 20,000 | 3,800 | 15,200 | 0 | 0 | 1,000 | 0 | 0 | 14 |
| | | | | | | | | | | | |

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

| | A<br>Characteristics | B<br>Published Numbers | C<br>Present in 2004 | D<br>04 units present in 95 | E<br>Changed in characteristics | G<br>04 mobile homes moved in | H<br>04 units derived from nonresidential use | I<br>04 units added through new construction | J<br>04 units added from temporary losses | K<br>04 units added by other means | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Occupied units** | 1,595,800 | 1,595,800 | 1,192,300 | 89,000 | 700 | 3,600 | 303,100 | 6,100 | 1,100 | 1 |
| | | | | | | | | | | | |
| | **Tenure** | | | | | | | | | | |
| 2 | Owner occupied | 1,133,500 | 1,133,500 | 747,100 | 137,000 | 700 | 2,200 | 243,300 | 2,500 | 700 | 2 |
| 3 | Percent own occpd | 71.0% | 71.0% | | | | | | | | 3 |
| 4 | Renter occupied | 462,300 | 462,300 | 289,800 | 107,500 | 0 | 1,400 | 59,800 | 3,500 | 400 | 4 |
| | | | | | | | | | | | |
| | **Renter Monthly Housing Costs** | | | | | | | | | | |
| 5 | Less than $350 | 45,200 | 51,300 | 23,700 | 23,700 | 0 | 400 | 3,600 | 0 | 0 | 5 |
| 6 | $350 to $599 | 63,100 | 66,200 | 23,500 | 37,400 | 0 | 0 | 3,200 | 1,800 | 400 | 6 |
| 7 | $600 to $799 | 151,400 | 154,500 | 52,600 | 81,800 | 0 | 700 | 18,000 | 1,400 | 0 | 7 |
| 8 | $800 to $1,249 | 158,300 | 152,500 | 34,100 | 89,500 | 0 | 400 | 28,600 | 0 | 0 | 8 |
| 9 | $1,250 or more | 29,000 | 28,200 | 500 | 22,000 | 0 | 0 | 5,700 | 0 | 0 | 9 |
| 10 | No cash rent | 15,300 | 9,500 | 1,400 | 7,100 | 0 | 0 | 700 | 400 | 0 | 10 |
| | | | | | | | | | | | |
| | **Renter Hsd Income** | | | | | | | | | | |
| 11 | Less than $15,000 | 101,900 | 103,500 | 28,400 | 65,300 | 0 | 400 | 9,400 | 0 | 0 | 11 |
| 12 | $15,000 to $29,999 | 113,800 | 117,500 | 23,200 | 82,100 | 0 | 0 | 9,700 | 2,500 | 0 | 12 |
| 13 | $30,000 to $49,999 | 136,300 | 135,500 | 26,700 | 87,000 | 0 | 700 | 20,400 | 700 | 0 | 13 |
| 14 | $50,000 to $99,999 | 87,900 | 85,300 | 12,300 | 55,300 | 0 | 400 | 17,000 | 400 | 0 | 14 |
| 15 | $100,000 or more | 22,300 | 20,600 | 500 | 16,500 | 0 | 0 | 3,300 | 0 | 400 | 15 |
| | | | | | | | | | | | |
| | **Owner Monthly Housing Costs** | | | | | | | | | | |
| 16 | Less than $350 | 228,400 | 203,300 | 69,100 | 108,300 | 0 | 400 | 24,800 | 400 | 400 | 16 |
| 17 | $350 to $599 | 149,400 | 162,800 | 26,700 | 112,600 | 400 | 400 | 22,300 | 400 | 0 | 17 |
| 18 | $600 to $799 | 94,600 | 99,400 | 14,400 | 70,600 | 0 | 400 | 13,600 | 400 | 0 | 18 |
| 19 | $800 to $1,249 | 311,200 | 290,400 | 75,900 | 141,400 | 400 | 700 | 71,300 | 700 | 0 | 19 |
| 20 | $1,250 or more | 349,900 | 377,600 | 105,200 | 159,700 | 0 | 400 | 111,300 | 700 | 400 | 20 |
| | | | | | | | | | | | |
| | **Owner Hsd Income** | | | | | | | | | | |
| 21 | Less than $15,000 | 95,500 | 98,200 | 13,500 | 73,800 | 0 | 400 | 10,600 | 0 | 0 | 21 |
| 22 | $15,000 to $29,999 | 113,900 | 114,400 | 22,600 | 76,400 | 0 | 400 | 14,700 | 400 | 0 | 22 |
| 23 | $30,000 to $49,999 | 227,800 | 223,600 | 36,700 | 137,000 | 0 | 0 | 49,200 | 700 | 0 | 23 |
| 24 | $50,000 to $99,999 | 399,100 | 397,700 | 122,500 | 175,800 | 700 | 700 | 96,500 | 1,100 | 400 | 24 |
| 25 | $100,000 or more | 297,400 | 299,600 | 81,000 | 144,800 | 0 | 700 | 72,400 | 400 | 400 | 25 |

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

Forward-looking Table 5 looks at how losses affected certain portions of the Atlanta 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] | 3.9% | 2.0% | 1.9% |
| Vacant units | 9.5% | 4.4% | 5.1% |
| Units in structures with 2-4 units | 4.6% | 3.6% | 1.0% |
| Units in structures with 5-9 units | 7.9% | 5.2% | 2.7% |
| Mobile homes/trailers | 16.4% | 3.1% | 13.3% |
| Units built 1930-1939 | 15.5% | 4.4% | 11.2% |
| Units built 1920-1929 | 11.9% | 6.9% | 5.0% |
| Units built in 1919 or earlier | 4.5% | 2.9% | 1.6% |
| Units with 1-4 rooms | 7.0% | 3.4% | 3.6% |
| Units with no bedrooms | 5.2% | 5.2% | 0.0% |
| Units in central cities | 7.9% | 5.6% | 2.3% |
| Units outside of central city | 3.3% | 1.5% | 1.9% |
| **Occupied units**[17] | 3.5% | 1.8% | 1.7% |
| Units with severe problems | 4.6% | 2.3% | 2.3% |
| Units with moderate problems | 9.3% | 4.6% | 4.7% |
| Units with a White householder | 3.3% | 1.3% | 2.0% |
| Units with a Black householder | 4.2% | 3.2% | 1.0% |
| Units with Hispanic householder | 4.7% | 1.2% | 3.5% |
| Household receives welfare/SSI | 10.8% | 7.9% | 2.9% |
| Owner-occupied units | 2.4% | 0.9% | 1.4% |
| Renter-occupied units | 5.4% | 3.3% | 2.1% |
| Renter-occupied – monthly housing costs less than $350 | 5.9% | 5.9% | 0.0% |
| Renter-occupied – household income less than $15,000 | 5.6% | 4.3% | 1.3% |

[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, 3.9 percent of the units in the 1996 housing stock was no longer part of the housing stock; 2.0 percent were permanent losses—that is, the units had either been demolished or destroyed by fire or natural disasters—while 1.9 percent were lost in ways that could be reversed, such as nonresidential use.

Units that were vacant in 1996 had a loss rate almost 2.5 times greater than the overall loss rate. Units in small structures also had high loss rates and mobile homes had a very high loss rate. Units built prior to 1940 had high loss rates. Those built between 1920 and 1939 had loss rates 3 to 4 times the average loss rate, while those built in 1919 or earlier had slightly higher than average loss rates. Small units had high loss rates. The central city loss rate was more than twice the loss rate in the rest of the metropolitan area.

Among units occupied in 1996, 3.5 percent were lost by 2004. The loss rate was higher for units with physical problems, and the rate for units with moderate physical problems was twice the rate for those with severe physical problems. The loss rates for units occupied by Black or Hispanic householders were greater than the 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 more than twice the loss rate among owner-occupied units. Low-cost rental units and rental units occupied by the lowest income households had high loss rates.

Backward-looking Table 5 presents addition rates for selected areas of the Atlanta 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 Atlanta housing stock in 2004, 20.1 percent were not in the 1996 housing stock. Most of the new units came from new construction; the return to the housing stock of units that were not available in 1996 accounted for less than 1 percent of the total units in 2004.

Single units in attached structures had an addition rate that was almost twice the average rate, while mobile homes and trailers had a rate less than half the average addition rate. Large units had high addition rates. Almost half of the added zero-bedroom units came from sources other than new construction. The addition rate in central cities was 60 percent of the addition rate in the rest of the metropolitan area.

Blacks had a higher than average rate of additions, the White rate was slightly below average, and the Hispanic rate was substantially below average. There were a substantial number of additions in both the owner-occupied and renter-occupied stock, but the owner-occupied stock had a higher percentage of additions. The addition rates were high for owner-occupied units with monthly housing costs greater than $1,250 and owner-occupied units with households with income of $100,000 or more.

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

| Category | Based on Columns in Tables 1-4 | | |
|---|---|---|---|
| | **All Additions** (G+H+I+J+K)/C | **New Construction** I/C | **Other Additions** G+H+J+K/C |
| **All units**[18] | 20.1% | 19.3% | 0.8% |
| Single-unit, attached structure | 37.9% | 35.3% | 2.6% |
| Mobile homes/trailers | 8.9% | 6.7% | 2.2% |
| Units with 9 rooms | 34.6% | 33.8% | 0.9% |
| Units with 10 or more rooms | 29.7% | 29.7% | 0.0% |
| Units with no bedrooms | 26.3% | 14.0% | 12.3% |
| Units in central cities | 12.5% | 9.7% | 2.9% |
| Units outside of central city | 21.0% | 20.5% | 0.5% |
| **Occupied units**[19] | 19.7% | 19.0% | 0.7% |
| Units with a white householder | 18.4% | 18.1% | 0.3% |
| Units with a Black householder | 22.6% | 21.1% | 1.5% |
| Units with Hispanic householder | 12.0% | 11.6% | 0.4% |
| Owner-occupied units | 22.0% | 21.5% | 0.5% |
| Renter-occupied units | 14.1% | 12.9% | 1.1% |
| Renter-occupied – monthly housing costs $800 to $1,249 | 19.0% | 18.8% | 0.3% |
| Owner-occupied – monthly housing costs $1,250 or more | 29.9% | 29.5% | 0.4% |
| Owner-occupied – household income $100,000 or more | 24.7% | 24.2% | 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 seven categories:

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

[18] All the rows above "Occupied units" refer to portions of the entire housing stock.
[19] All the rows below "Occupied units" refer to portions of the occupied housing stock.
[20] "Affordable" is defined as monthly housing costs less than or equal to 30 percent of the highest income in the category.

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

| Affordability Groups | A Total in 1996 | B Non-Market in 2004 | C Extremely Low Rent in 2004 | D Very Low Rent in 2004 | E Low Rent in 2004 | F Moderate Rent in 2004 | G High Rent in 2004 | H Very or Extremely High Rent in 2004 | I Owner Occupied in 2004 | J Seasonal or Vacant in 2004 | K Lost to Stock in 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Non-market** | 59,300 | 21,300 | 10,400 | 9,000 | 1,400 | 0 | 500 | 500 | 7,200 | 4,500 | 4,600 |
| **Extremely Low Rent** | 23,100 | 1,800 | 4,500 | 3,200 | 900 | 0 | 0 | 0 | 4,100 | 8,100 | 500 |
| **Very Low Rent** | 169,000 | 4,100 | 13,700 | 77,600 | 5,000 | 900 | 0 | 500 | 20,800 | 33,500 | 13,000 |
| **Low Rent** | 109,800 | 1,800 | 2,300 | 44,300 | 12,200 | 4,500 | 900 | 0 | 20,800 | 17,400 | 5,600 |
| **Moderate Rent** | 94,000 | 500 | 2,300 | 21,300 | 15,400 | 9,500 | 0 | 1,800 | 29,700 | 12,700 | 900 |
| **High Rent** | 18,100 | 0 | 0 | 500 | 2,300 | 3,200 | 500 | 900 | 7,700 | 2,300 | 900 |
| **Very or Extremely High Rent** | 900 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 500 | 0 | 0 |
| **Total** | 474,100 | 29,400 | 33,200 | 155,800 | 37,100 | 18,500 | 1,800 | 3,600 | 90,800 | 78,400 | 25,500 |

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

| Affordability Groups | A Total in 2004 | B Non-Market in 1996 | C Extremely Low Rent in 1996 | D Very Low Rent in 1996 | E Low Rent in 1996 | F Moderate Rent in 1996 | G High Rent in 1996 | H Very or Extremely High Rent in 1996 | I Owner Occupied in 1996 | J Seasonal or Vacant in 1996 | K New Construc-tion | L Other Additions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Non-market** | 43,400 | 22,300 | 1,900 | 4,300 | 1,900 | 500 | 0 | 0 | 6,600 | 2,800 | 2,800 | 400 |
| **Extremely Low Rent** | 53,400 | 10,400 | 4,700 | 14,400 | 2,400 | 2,400 | 0 | 0 | 7,100 | 6,600 | 4,300 | 1,100 |
| **Very Low Rent** | 236,000 | 9,500 | 3,300 | 80,300 | 45,500 | 22,300 | 500 | 0 | 19,200 | 27,000 | 25,100 | 3,500 |
| **Low Rent** | 65,600 | 1,400 | 500 | 5,200 | 12,800 | 16,100 | 2,400 | 0 | 8,500 | 3,800 | 15,000 | 0 |
| **Moderate Rent** | 47,300 | 0 | 0 | 900 | 4,700 | 9,900 | 3,300 | 500 | 14,200 | 4,600 | 8,700 | 400 |
| **High Rent** | 7,200 | 500 | 0 | 0 | 900 | 0 | 500 | 0 | 2,700 | 900 | 1,600 | 0 |
| **Very or Extremely High Rent** | 9,300 | 500 | 0 | 500 | 0 | 1,900 | 900 | 0 | 2,400 | 900 | 2,200 | 0 |
| **Total** | 462,300 | 44,500 | 10,400 | 105,600 | 68,200 | 53,000 | 7,600 | 500 | 60,700 | 46,800 | 59,800 | 5,300 |

- Very low rent (monthly housing costs affordable to renters with incomes greater than 30 percent but less than or equal to 50 percent of local area median income).

- Low rent (monthly housing costs affordable to renters with incomes greater than 50 percent but less than or equal to 60 percent of local area median income).

- Moderate rent (monthly housing costs affordable to renters with incomes greater than 60 percent but less than or equal to 80 percent of local area median income).

- High rent (monthly housing costs affordable to renters with incomes greater than 80 percent but less than or equal to 100 percent of local area median income).

- Very high rent or extremely high rent (monthly housing costs affordable to renters with incomes greater than 100 percent of local area median income).[21]

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

Table A shows that there were 474,100 rental units in the Atlanta metropolitan area in 1996. In 2004, 194,700 of those units were no longer rental; 90,800 were owner-occupied, 78,400 were either vacant or being used seasonally, and 25,500 had been lost to the stock. Taken as a proportion of the units in 1996, movement into owner-occupancy was highest among units in the three highest rent categories, and losses to the stock were concentrated among non-market units and very low rent units.

Table B shows there were 462,300 rental units in the Atlanta metropolitan area in 2004, of which 172,600 were not rental units in 1996. The new units came from units that had been owner-occupied (60,700), units that had been vacant or in seasonal use (46,800), newly constructed units (59,800), and other additions (5,300). Most of the formerly owner-occupied units went to the moderate rent and very low rent categories; most of the newly constructed rental units went to the moderate rent and low rent categories.

Looking at both tables, we see that the overall number of rental units increased by approximately 15,000 units. The number of extremely low rent and very low rent units combined grew from slightly over 190,000 in 1996 to almost 290,000 in 2004.

[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 Atlanta between 1996 and 2004. Overall, the number of rental units declined by approximately 2.5 percent. The totals conceal considerable movement into and out of the rental market with the gross flows summing to almost 370,000 units. Tables A and B also show that there was considerable movement by individual units across the affordability categories. The net effect of the gross flows into and out of the rental stock and the movement across rental categories was a substantial increase in the number of units affordable to the lowest income renters.

## *Appendix A – Internal and External Checks*

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

- For each row, we tested whether the sum of possible outcomes (columns D though K) equaled the number of units present in the base year (column C). In every case, exact equality was achieved prior to rounding.

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

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

## *Appendix B – Weighting*

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

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

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

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

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