

**American Housing Survey**

**Components of Inventory Change and  
Rental Dynamics Analysis:  
Birmingham, 1998–2011**

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## ***Executive Summary***

Components of Inventory Change (CINCH) is a tool used by housing analysts to study how the housing inventory changes over time. One typically thinks of the housing stock as evolving through two mechanisms—the construction of new units and the demolition of old units. While new construction and losses through demolition and natural disasters are the primary means by which the housing stock changes, CINCH shows that there are other important engines of change.

This report describes how the housing stock in the Birmingham metropolitan area changed between 1998 and 2011, with particular emphasis on affordable rental housing. The study uses data from the American Housing Survey, which collected detailed information on housing units in Birmingham and on their occupants in both 1998 and 2011.

In 1998 the Birmingham metropolitan area contained 394,100 housing units, including vacant units. By 2011 the number of housing units had increased to 502,000. Part of this increase was due to a redefinition of the metropolitan area that added three counties. We estimate that the 2011 count of housing units for the metropolitan area as defined in 1998 would be 444,900. This represents an overall increase of 12.9 percent, which translates to an average annual increase of 0.9 percent over the 13-year period.

Between 1998 and 2011, only 8,400 units left the housing stock. Of these, 4,700 are clearly permanent losses—the original unit is gone, and major construction would be required to replace it with a new unit. Another 800 are temporary losses—the original unit needs repairs or is being used for other purposes. These units may or may not return to the housing stock. Finally, there were 2,900 units that left the housing stock either permanently or temporarily for “other” reasons, a category that encompasses a wide variety of situations.

In the period between the 1998 and the 2011 AHS surveys, 110,100 units were added to the housing stock. Ninety-six percent of these additions were newly constructed units. The 2011 AHS did track move-ins of mobile homes in Birmingham, a factor accounting for 1,800 new units. Also, 400 new units were formed from the conversion or merger of 1998 units. We classified 1,400 units as recovered because these units had been in the housing stock at some point but were classified in 1998 as nonresidential (700) or uninhabitable (700). Finally, 600 units were added in other unclassified ways.

The Birmingham metropolitan area lost 2.1 percent of all 1998 housing units by 2011; additions between 1998 and 2011 represent 21.9 percent of the 2011 housing stock. Losses and additions varied across portions of the Birmingham housing market defined by the characteristics of the unit or its occupants. We observed the following patterns that were both atypical of the overall housing stock and statistically significant:

- More recently built units (1995–1999) had a low loss rate, while older units (1940–1949) had a high loss rate.

- Larger units (e.g., units with seven rooms and units with three bedrooms) appear to have lower loss rates.
- Among multifamily units, those in buildings with three floors had a low loss rate.
- Units reporting moderate heating problems in 1998 had a high loss rate.
- New additions were underrepresented among units that were vacant in 2011.
- The rate of addition varied by structure type. Single-family detached units had a higher-than-average rate of addition, and single-family attached units had a very high rate of addition. As a group, multifamily units had a low rate of addition; the rates of addition were particularly low for smaller multifamily buildings (those with 5 to 19 units and those with only 2 stories).
- Unit size mattered. Units with 3 or 4 rooms or 1 or 2 bedrooms had lower-than-average rates of addition; those with 8 rooms or 10 or more rooms or with 4 or more bedrooms had very high rates of addition.
- The rates of addition were low for units that reported severe or moderate physical problems. Plumbing deficiencies show up as a specific problem.
- Units occupied in 2011 by households with elderly householders (65 or older) had low rates of addition, while those occupied by householders younger than 65 had an above-average rate. Units occupied in 2011 by households with children had an above-average rate of addition, while those without children had a below-average rate.
- Units occupied by Black or Hispanic householders in 2011 had experienced lower-than-average rates of addition; those with White householders had experienced higher-than-average rates.
- The rate of addition among units that were renter-occupied in 2011 was substantially lower than that of all occupied units. Among renter-occupied units, addition rates clearly varied by monthly housing costs and household income in 2011. Those units with low housing costs (less than \$1,250) or occupied by lower income renters (less than \$50,000) had lower rates of addition, while those with high housing costs (\$1,250 or more) or occupied by high-income renters (\$100,000 or more) had higher-than-average rates of addition.
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units. Among owner-occupied units, addition rates clearly varied by monthly housing costs and household income in 2011. Those occupied by lower income owners (less than \$30,000) and those with lower monthly housing costs (less than \$600) had lower than average rates of addition, while those occupied by higher income owners (\$50,000 or more) and those with high monthly housing cost (\$800 or more) had higher-than-average rates of addition.

The 1998 rental stock in Birmingham was on the borderline between being affordable and not being affordable. Of the 121,500 rental units in 1998, 41,600 were extremely low rent or very low rent units. In addition, 20,100 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 50.8 percent of the 1998 rental stock. The three highest rent categories comprised 8.5 percent of the rental stock, but almost no units were in the very-high-rent or extremely-high-rent categories. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—25.8 percent of all 1998 units compared to 19.0 percent. By 2011, 23.2 percent of the 273,400 rental units in 1998 were no longer in the rental stock. The largest proportion of these losses was due to changes in tenure.

The rental stock in Birmingham was less affordable in 2011 than in 1998. Of the 135,100 rental units in 2011, 35,900 were extremely-low-rent or very-low-rent units. In addition, 22,700 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 43.4 percent of the 2011 rental stock. The three highest rent categories comprised 8.4 percent of the rental stock. Moves from a more affordable category (sometimes called gentrification) exceeded moves from a less affordable category (sometimes called filtration)—21.2 percent of all 2011 units compared to 15.3 percent. Of the 135,100 rental units in 2011, 37.6 percent were not rental in 1998. The largest proportion of these gains was due to changes in tenure.

# Components of Inventory Change and Rental Dynamics Analysis: Birmingham, 1998–2011

## 1. Introduction

This report describes how the housing stock in the Birmingham metropolitan area changed between 1998 and 2011, with particular emphasis on affordable rental housing. The study uses data from the American Housing Survey (AHS), which collected detailed information on housing units in Birmingham and on their occupants in both 1998 and 2011.<sup>1</sup>

As part of its Components of Inventory Change (CINCH) program, the U.S. Department of Housing and Urban Development (HUD) has funded, for a number of years, similar studies of metropolitan areas to document changes in the American housing stock. These studies have traditionally included an assessment of changes in the rental housing market called rental dynamics. This paper is one of 29 metropolitan CINCH studies based on the information provided by the 2011 AHS.<sup>2</sup>

CINCH reports present both forward-looking analysis (what happened to the 1998 units by 2011) and backward-looking analysis (where the 2011 units came from in terms of 1998).<sup>3</sup> This paper repeats the analysis contained in the most recent CINCH and rental dynamics studies, but its organization differs from that of previous reports.

- Section 2 discusses data and related issues that affect the CINCH and rental dynamics analysis for Birmingham.
- Section 3 explains the changes in the housing stock between 1998 and 2011 in terms of losses to the housing stock through demolitions or the other ways units can leave the housing stock and additions through new construction and other means.
- Section 4 looks at components of the housing stock that experienced losses or additions markedly different from the overall patterns of losses and additions.

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<sup>1</sup> Since 1973, the U.S. Department of Housing and Urban Development (HUD) and the Census Bureau have conducted an extensive survey of the American housing stock called the American Housing Survey (AHS). The AHS has two components: a national survey that, since 1985, has collected data every 2 years on the entire U.S. housing stock and a metropolitan component that, since 1985, has collected data at various times on the housing stock of 45 metropolitan areas. Both the national and metropolitan components use the same sample of housing units in successive surveys, making it possible to observe changes in units over time. The initial samples have been augmented in later years to account for units added by new construction or other means.

<sup>2</sup> HUD also funds CINCH studies of survey-to-survey changes in the national stock. At the national level, the Rental Dynamics studies are published separately. For a complete list of all CINCH studies, see <http://www.huduser.org/portal/datasets/cinch.html>.

<sup>3</sup> The forward-looking analysis was previously presented to HUD in December 2013. The data needed to produce the backward-looking analysis did not become available until after the allowed period of performance of the contract under which the previous report was completed.

- Section 5 breaks the rental housing stock into eight affordability categories and tracks what happened to units in each of those categories between 1998 and 2011.
- Section 6 summarizes the changes to the housing stock of the Birmingham metropolitan area between 1998 and 2011.

The paper concludes with two appendices that contain analyses and data found in the body of previous CINCH reports.

- Appendix A explains the CINCH and rental dynamics methodologies.
- Appendix B contains the detailed CINCH and rental dynamics tables found in previous reports.

National economic conditions shaped in important ways the changes observed in this report. The 1998–2011 period began toward the end of the longest recorded business cycle (March 1991 to November 2001), encompassed a vigorous expansion (November 2001 to December 2007), included the recent harsh recession (December 2007 to June 2009), and ended with a period of lackluster recovery.

## **2. Special Issues: Birmingham**

Metropolitan areas are composed of counties or townships that are interrelated economically. The Office of Management and Budget periodically adjusts the composition of metropolitan areas as the economic relationships among counties change. In some cases, the AHS retains the metropolitan boundaries in effect when the original metropolitan sample was drawn; in other cases, the AHS will adjust the original sample to correspond to the new definition of the metropolitan area. A change in sample boundaries will affect the interpretation of CINCH analysis and its precision. The absolute sample size available to study changes between surveys determines how reliably the observed changes are measured.

### **Geography**

In 1998 the Birmingham metropolitan area contained 394,100 housing units, including vacant units. By 2011 the number of housing units had increased to 502,000. Part of this increase was due to a redefinition of the metropolitan area that added three counties (Bibb, Chilton, and Walker). Using the American Community Survey (2011, 5-year data) at the county level, we estimate that the 2011 count of housing units for the metropolitan area as defined in 1998 would be 444,900. This represents an overall increase of 12.9 percent, which translates to an average annual increase of 0.9 percent over the 13-year period.

The change in the geographical definition of Birmingham affects the interpretation of the information presented in this report. Our analysis applies only to that portion of the metropolitan area that was common to the Birmingham metropolitan area as defined in both 1998 and 2011, but the application to the common area is not precise, as explained in Appendix A.



## **Sample size**

Both CINCH and rental dynamics require that, if a sample unit is in both the 1998 and 2011 housing stock, it must be interviewed in both surveys to be included in the analysis. Other analytical requirements also limit effective sample size. There are 1,988 sample units that were common to the 1998 and 2011 AHS Birmingham surveys and satisfied all the analytical requirements.<sup>4</sup> Between 1998 and 2011, 91 sample units in the common area meeting the analytical requirements were lost to the stock; thus, the forward-looking analysis is based on a maximum of 2,079 sample units. Between 1998 and 2011, 533 sample units meeting the analytical requirements were added to the AHS to represent additions to the stock throughout the metropolitan area as defined in 2011; thus, the backward-looking analysis is based on a maximum of 2,531 sample units. In the forward-looking analysis, the average weight of a sample unit is approximately 190 units; in the backward-looking analysis, the average weight of a sample unit is approximately 199 units.

## **Data reliability**

All CINCH analysis relies on two AHS variables: NOINT (why there was no interview), which, among other things, explains why a unit is temporarily or permanently out of the stock, and REUAD (why unit added), which explains why a sample unit entered the sample. Both variables require some detective work on the part of Census Bureau staff, and the longer the period between surveys, the more difficult the detective work. At the national level, the AHS data are collected every 2 years, so it is relatively easy to determine why a unit has been removed from or added to the sample. In the case of Birmingham, 13 years separate the 2011 sample from the 1998 sample. As a result, explaining the loss or addition of sample units is very challenging. This report is part of a series that compares the housing stock in 2011 to the housing stock of 7 metropolitan areas in 1998, 12 metropolitan areas in 2002, 8 metropolitan areas in 2004, and 2 metropolitan areas in 2009. We compared the pattern of changes across the 29 areas studied in these reports to the changes recorded between 2009 and 2011 at the national level. With respect to losses, the patterns are reasonably similar except for the role played by the movement of mobile homes. Mobile home move-outs are much more important in explaining losses at the national level. At both the national and metropolitan levels, the “other” category accounts for one-fifth to one-quarter of the losses. With respect to additions, new construction accounts for 72 percent of all additions at the national level but 94 percent at the metropolitan level. We suspect that data issues downplay the importance of “means other than new construction” at the metropolitan level.

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<sup>4</sup> The 1998 AHS surveyed 5,066 units in the Birmingham metropolitan area; 2,553 of these units were in the 2011 AHS public use file (PUF). Of the 2,513 sample units no longer in the survey, 202 were legitimate temporary or permanent losses to the housing stock and were considered for the analysis. The remaining 2,311 cases are coded as “sample reduction for the current survey year” with no further explanation.

### 3. Changes to the Housing Stock: 1998–2011

#### Losses between 1998 and 2011

One typically thinks of the housing stock evolving through two mechanisms: the construction of new units and the demolition of old units. While new construction and losses through demolition and natural disasters are the primary means by which the housing stock changes, CINCH shows that there are other important engines of change.

Table 1 reports that between 1998 and 2011, only 8,400 units left the housing stock.<sup>5</sup> Of these, 4,700 are clearly permanent losses—the original unit is gone, and major construction would be required to replace it with a new unit. Another 800 are temporary losses—the original unit needs repairs or is being used for other purposes. These units may or may not return to the housing stock. Finally, there were 2,900 units that left the housing stock either permanently or temporarily for “other” reasons, a category that encompasses a wide variety of situations.

**Table 1: Disposition of 1998 Birmingham Housing Units in 2011<sup>6</sup>**

Present in 1998	394,100
1998 units present in 2011	385,700
<b>Units no longer in the stock</b>	<b>8,400</b>
1998 units lost due to conversion/merger	300
1998 house or mobile home moved out	600
1998 units lost through demolition or disaster	3,800
<b>Permanent losses</b>	<b>4,700</b>
1998 units changed to nonresidential use	200
1998 units badly damaged or condemned	500
<b>Temporary losses</b>	<b>800</b>
<b>1998 units lost in other ways</b>	<b>2,900</b>

Demolitions and natural disasters accounted for 3,800 of the permanent losses, while mergers and conversions contributed another 300 permanent losses. “Conversion” is the terminology used in the AHS for the splitting of a unit into two or more units. The movement of a mobile home or house is considered a permanent loss because a housing unit is the combination of land and capital. While movement preserves the capital, it dissolves the union of capital and land that formed the original unit; therefore, the movement of a mobile home is considered a permanent loss. The 2011 AHS survey in Birmingham did track mobile home move-outs, which accounted for an additional 600 permanent losses.

Sometimes houses are used for business purposes. Such commercial use or the use of a house for a group home is considered a change to a nonresidential use. Badly damaged units may be repaired, left in an unusable state, or demolished.

<sup>5</sup> With the caveats noted in Appendix A, this analysis applies to the area common to both the 1998 and 2011 definitions of the metropolitan area.

<sup>6</sup> Numbers may not add consistently due to rounding. Counts were rounded to the nearest hundred.

Appendix B contains four forward-looking tables that break the overall stock into more than 100 subgroups, such as single-family detached houses or units occupied by Black householders in 1998. For each subgroup, these tables detail how many of the 1998 units in that subgroup are in the same subgroup in 2011, have moved into another subgroup, or have left the stock and how they left the stock. Section 4 looks across the Appendix B forward-looking tables and focuses on those subgroups that lost an unusually high or an unusually low number of units over the 1998–2011 period.

## Additions between 1998 and 2011

Table 2, together with the backward-looking Appendix B tables, provides a great deal of information on additions to the housing stock between 1998 and 2011.<sup>7</sup>

**Table 2: Sources for 2011 Birmingham Housing Stock<sup>8</sup>**

2011 housing stock	502,000
2011 units present in 1998	391,900
<b>Total additions to stock</b>	<b>110,100</b>
Units added by new construction	105,900
House or mobile home moved in	1,800
Units added by conversion/merger	400
<b>New or reconstructed units</b>	<b>108,100</b>
Units added from nonresidential use	700
Units added from temporary losses	700
<b>Recovered units</b>	<b>1,400</b>
<b>Units added in other ways</b>	<b>600</b>

In the period between the 1998 and the 2011 AHS surveys, 110,100 units were added to the housing stock. Ninety-six percent of these additions were newly constructed units. The 2011 AHS did track move-ins of mobile homes in Birmingham, a factor accounting for 1,800 new units. Also, 400 new units were formed from the conversion or merger of 1998 units.

We classified 1,400 units as recovered because these units had been in the housing stock at some point but were classified in 1998 as nonresidential (700) or uninhabitable (700). Finally, 600 units were added in other unclassified ways.

Appendix B contains four backward-looking tables that break the overall stock into more than 100 subgroups. For each subgroup, these tables detail how many of the 2011 units in that subgroup were in the same subgroup in 1998, have moved from another subgroup, or are new additions to the stock. Section 4 looks across the Appendix B backward-looking tables and focuses on those subgroups that gained an unusually high or an unusually low number of units over the 1998–2011 period.

<sup>7</sup> With the caveats noted in Appendix A, this analysis applies to the area common to both the 1998 and 2011 definitions of the metropolitan area. Inconsistencies between Tables 1 and 2 result from a combination of (1) changes in metropolitan boundaries, (2) changes in control housing counts between censuses, and (3) different weights.

<sup>8</sup> Numbers may not add consistently due to rounding. Counts were rounded to the nearest hundred.

#### 4. Components With Atypical Losses or Additions

The Birmingham metropolitan area lost 2.1 percent of all 1998 housing units by 2011, but the loss rate varied across sectors of the stock. For example, the occupied housing stock lost 1.9 percent of its units between 1998 and 2011.

We examined all of the components of the 1998 Birmingham housing stock contained in the four forward-looking tables in Appendix B to identify subgroups with unusual loss rates. Forward-Looking Table A reports information on all units in the stock; Table 3 lists subgroups from Table A with loss rates statistically different than the loss rate of the overall stock. Forward-Looking Tables B, C, and D describe important characteristics of occupied units and their residents; Table 3 lists subgroups from those tables with loss rates statistically different than the loss rate of occupied units. We also employed judgment in selecting among components with statistically different loss rates. In general, we looked for subgroups with loss rates less than half or more than double the benchmark rate, but we listed other subgroups if their inclusion illustrated interesting patterns within loss rates. Finally, Table 3 includes the loss rates for four key segments of the housing market—occupied units, vacant units, owner-occupied units, and renter-occupied units—even if their loss rates are not statistically different.

**Table 3: Sectors Experiencing Atypical Loss Rates in Birmingham, 1998–2011<sup>9</sup>**

Characteristics	Present in 1998	Total lost	Percent lost
<i>Housing stock</i>	394,100	8,400	2.1%
<i>Occupancy status</i>			
Occupied	358,800	6,800	1.9%
Vacant	32,200	1,500	4.8%
<i>Year built</i>			
1995–1999	30,700	200	0.8%*
1940–1949	33,200	1,800	5.5%**
<i>Rooms</i>			
7	34,200	200	0.7%**
<i>Bedrooms</i>			
3	68,000	500	0.7%***
<i>Stories in structure (multifamily)</i>			
3	25,700	100	0.4%***
<i>Moderate problems</i>			
Heating	13,000	1,000	8.1%*
<i>Tenure</i>			
Owner-occupied	252,700	4,000	1.6%
Renter-occupied	106,100	2,800	2.6%

\* Statistically different from either all units or all occupied units, as appropriate, at the 10-percent level.

\*\* Statistically different from either all units or all occupied units, as appropriate, at the 5-percent level.

\*\*\* Statistically different from either all units or all occupied units, as appropriate, at the 1-percent level.

<sup>9</sup> Two conditions were necessary for a housing sector to appear in Table 3, one mathematical and one judgmental: (1) the difference between the sector's loss rate and the benchmark rate had to have been statistically significant at the 10-percent level, and (2) the difference had to be interesting. Counts are rounded to the nearest hundred.

Table 3 identifies loss rates that were both atypical of the overall housing stock and statistically significant:

- More recently built units (1995–1999) had a low loss rate, while older units (1940–1949) had a high loss rate.
- Larger units appear to have lower loss rates (e.g., units with 7 rooms and units with 3 bedrooms).
- Among multifamily units, those in buildings with 3 floors had a low loss rate.
- Units reporting moderate heating problems in 1998 had a high loss rate.

The 110,100 additions reported in Table 2 represent 21.9 percent of the 2011 housing stock. The rate of addition varied by the characteristics of the housing. Additions represented 22.9 percent of occupied units.

We examined all of the components of the 1998 Birmingham housing stock contained in the four backward-looking tables in Appendix B to identify subgroups with unusual addition rates. Backward-Looking Table A reports information on all units in the stock; Table 4 lists subgroups from Table A with addition rates statistically different than the addition rate of the overall stock. Backward-Looking Tables B, C, and D describe important characteristics of occupied units and their residents; Table 4 lists subgroups from those tables with addition rates statistically different than the addition rate of occupied units. We also employed judgment in selecting among components with statistically different addition rates. In general, we looked for subgroups with addition rates less than half or more than double the benchmark rate, but we listed other subgroups if their inclusion illustrated interesting patterns within addition rates. Finally, Table 4 includes the addition rates for four key segments of the housing market—occupied units, vacant units, owner-occupied units, and renter-occupied units—even if their addition rates are not statistically different.

**Table 4: Sectors Experiencing Atypical Rates of Addition in Birmingham, 1998–2011<sup>10</sup>**

Characteristics	Present in 2011	Total additions	Percent additions
<i>Housing stock</i>	502,000	110,100	21.9%
<i>Occupancy status</i>			
Occupied	419,400	95,900	22.9%
Vacant	76,000	12,600	16.5% **
<i>Units in structure</i>			
1, detached	358,800	86,500	24.1% *
1, attached	15,300	5,400	35.5% **
5 to 9	17,600	1,300	7.5% ***
10 to 19	22,200	1,400	6.1% ***
20 to 49	17,800	2,200	12.2% ***
<i>Rooms</i>			
3	20,600	1,800	8.6% ***
4	77,800	9,000	11.6% ***
8	47,400	13,200	27.8% **
10 or more	18,300	7,100	38.6% ***
<i>Bedrooms</i>			
1	30,400	2,200	7.3% ***
2	124,200	15,900	12.8% ***
4 or more	102,700	34,300	33.4% ***
<i>Multiunit structures</i>	78,200	8,800	11.2% ***
<i>Stories in structure</i>			
1	11,800	1,600	13.6% *
2	35,300	3,400	9.6% ***
3	28,400	3,800	13.3% ***
<i>Lack some plumbing</i>	4,900	200	4.2% ***
No exclusive use of bathroom facilities	4,200	200	4.9% ***
<i>Severe problems</i>	8,900	400	4.4% ***
Plumbing	4,900	200	4.2% ***
<i>Moderate problems</i>	14,500	900	6.0% ***
<i>Age of householder</i>			
Under 65	326,300	82,500	25.3% *
65 to 74	52,400	7,300	13.9% ***
75 or older	40,700	6,200	15.3% ***
<i>Children in household</i>			
Some	126,400	39,000	30.8% ***
None	293,000	57,000	19.4% ***

<sup>10</sup> Two conditions were necessary for a housing sector to appear in Table 4, one mathematical and one judgmental: (1) the difference between the sector's addition rate and the benchmark rate had to have been statistically significant at the 10-percent level, and (2) the difference had to be interesting. Counts are rounded to the nearest hundred.

Characteristics	Present in 2011	Total additions	Percent additions
<i>Race and ethnicity</i>			
White alone	312,600	79,700	25.5% **
White Hispanic	11,900	1,500	12.5% ***
White Non-Hispanic	300,800	78,200	26.0% **
Black alone	100,900	14,400	14.3% ***
Black Non-Hispanic	100,700	14,400	14.3% ***
Hispanic or Latino (any race)	12,100	1,500	12.3% **
<i>Tenure</i>			
Owner-occupied	309,100	81,700	26.4% **
Renter-occupied	110,300	14,200	12.9% ***
<i>Renter monthly housing costs</i>			
Less than \$350	5,400	200	4.4% ***
\$350 to \$599	16,500	800	4.6% ***
\$600 to \$799	28,700	2,400	8.3% ***
\$800 to \$1,249	41,900	5,500	13.1% ***
\$1,250 or more	8,200	3,000	36.4% *
<i>Renter household income</i>			
Less than \$15,000	33,500	3,100	9.2% ***
\$15,000 to \$29,999	29,300	2,800	9.5% ***
\$30,000 to \$49,999	23,400	1,600	7.0% ***
\$100,000 or more	5,600	2,100	38.3% *
<i>Owner monthly housing costs</i>			
Less than \$350	50,100	6,200	12.4% ***
\$350 to \$599	62,300	9,800	15.8% ***
\$800 to \$1,249	73,200	20,400	27.9% **
\$1,250 or more	92,200	37,100	40.2% ***
<i>Owner household income</i>			
Less than \$15,000	37,300	5,500	14.8% ***
\$15,000 to \$29,999	49,500	6,600	13.4% ***
\$50,000 to \$99,999	95,100	27,500	28.9% ***
\$100,000 or more	69,600	27,600	39.6% ***

\* Statistically different from either all units or all occupied units, as appropriate, at the 10-percent level.

\*\* Statistically different from either all units or all occupied units, as appropriate, at the 5-percent level.

\*\*\* Statistically different from either all units or all occupied units, as appropriate, at the 1-percent level.

Table 4 identifies rates of addition that were both atypical of the overall housing stock and statistically significant:

- New additions were underrepresented among units that were vacant in 2011.
- The rate of addition varied by structure type. Single-family detached units had a higher-than-average rate of addition, and single-family attached units had a very high rate of addition. As a group, multifamily units had a low rate of addition; the rates of addition were particularly low for smaller multifamily building (those with 5 to 19 units and those with only 2 stories).

- Unit size mattered. Units with 3 or 4 rooms or 1 or 2 bedrooms had lower-than-average rates of addition; those with 8 rooms or 10 or more rooms or with 4 or more bedrooms had very high rates of addition.
- The rates of addition were low for units reporting severe or moderate physical problems. Plumbing deficiencies show up as a specific problem.
- Units occupied in 2011 by households with elderly householders (65 or older) had low rates of addition, while those occupied by householders younger than 65 had an above-average rate. Units occupied in 2011 by households with children had an above-average rate of addition, while those without children had a below-average rate.
- Units occupied by Black or Hispanic householders in 2011 had experienced lower-than-average rates of addition; those with White householders had experienced higher-than-average rates.
- The rate of addition among units that were renter-occupied in 2011 was substantially lower than that of all occupied units. Among renter-occupied units, addition rates clearly varied by monthly housing costs and household income in 2011. Those units with low housing costs (less than \$1,250) or occupied by lower income renters (less than \$50,000) had lower rates of addition, while those with high housing cost (\$1,250 or more) and those occupied by high-income renters (\$100,000 or more) had higher-than-average rates of addition.
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units. Among owner-occupied units, addition rates clearly varied by monthly housing costs and household income in 2011. Those occupied by lower income owners (less than \$30,000) and those with lower monthly housing costs (less than \$600) had lower-than-average rates of addition, while those occupied by higher income owners (\$50,000 or more) and those with high monthly housing costs (\$800 or more) had higher-than-average rates of addition.

## **5. Rental Market Dynamics: 1998–2011**

Rental market dynamics focuses on the supply of rental housing and how that supply changes over time. Rental dynamics analysis has many of the features of CINCH analysis. A key step in rental dynamics analysis is to separate the rental stock into classes or strata based on how affordable the units are. This paper uses eight categories:

- Non-market: Either no cash rent or a subsidized rent.
- Extremely low rent: Affordable to renters with incomes less than or equal to 30 percent of local area median income.
- Very low rent: Affordable to renters with incomes greater than 30 percent but less than or equal to 50 percent of local area median income.



- Low rent: Affordable to renters with incomes greater than 50 percent but less than or equal to 60 percent of local area median income.
- Moderate rent: Affordable to renters with incomes greater than 60 percent but less than or equal to 80 percent of local area median income.
- High rent: 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: Affordable to renters with incomes greater than 100 percent but less than or equal to 120 percent of local area median income.
- Extremely high rent: Affordable to renters with incomes greater than 120 percent of local area median income.

For each category, “affordable” is defined as a gross-rent-to-income ratio of 30 percent or less for the higher of the incomes that define the boundaries for that category.<sup>11</sup> The categories are defined relative to area median income; therefore, the boundaries of the categories will change as area median income changes.

Table 5 summarizes what happened to the 1998 rental units by how affordable they were in 1998. It is based on Forward-Looking Rental Dynamics Table 1 in Appendix B, which traces in more detail where these units wound up in 2011.

**Table 5: Summary of Forward-Looking Rental Dynamics for Birmingham**

Affordability categories	1998 rental units	To more affordable categories in 2011	In same affordability category in both years	To less affordable categories in 2011	1998 rental units non-rental in 2011
Non-market	20,100	NA	39.7%	41.6%	18.7%
Extremely low rent	7,500	13.5%	2.6%	37.7%	46.2%
Very low rent	34,100	9.6%	33.9%	30.7%	25.9%
Low rent	20,000	22.5%	27.7%	31.5%	18.4%
Moderate rent	29,500	25.7%	44.0%	9.3%	21.0%
High rent	10,100	67.0%	6.5%	4.4%	22.1%
Very high rent	200	0.0%	0.0%	100.0%	0.0%
Extremely high rent	0	0.0%	0.0%	NA	0.0%
Total	121,500	19.0%	32.0%	25.8%	23.2%

The 1998 rental stock in Birmingham was on the borderline between being affordable and not being affordable. Of the 121,500 rental units in 1998, 41,600 were extremely low rent or very low rent units. In addition, 20,100 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 50.8 percent of the 1998 rental stock. The three highest rent categories comprised 8.5 percent of the rental stock, but almost no units were in the very high rent or extremely high rent categories. Moves to a less affordable

<sup>11</sup> Gross rent is equal to rent plus utilities.

category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—25.8 percent of all 1998 units compared to 19.0 percent.

By 2011, 23.2 percent of the 121,500 rental units in 1998 were no longer in the rental stock (28,200 units). The largest proportion of these losses was due to changes in tenure, with 18,500 rental units becoming owner-occupied or vacant for sale in 2011. Another 6,300 units became seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally, 3,400 rental units were no longer in the housing stock in 2011. Some of these losses were permanent; that is, the units were demolished or destroyed. Some losses were potentially reversible, such as units being used for nonresidential purposes. Forward-Looking Rental Dynamics Table 2 shows how the movement out of the rental stock varied across the affordability categories.

Table 6 summarizes where the 2011 rental units came from, with respect to 1998, by how affordable they were in 2011. It is based on Backward-Looking Rental Dynamics Table 1 in Appendix B, which traces in more detail the origin of these units.

The rental stock in Birmingham was less affordable in 2011 than in 1998. Of the 135,100 rental units in 2011, 35,900 were extremely low rent or very low rent units. In addition, 22,700 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 43.4 percent of the 2011 rental stock. The three highest rent categories comprised 8.4 percent of the rental stock. Moves from a more affordable category (sometimes called gentrification) exceeded moves from a less affordable category (sometimes called filtration)—21.2 percent of all 2011 units compared to 15.3 percent.

**Table 6: Summary of Backward-Looking Rental Dynamics for Birmingham**

Affordability categories	2011 rental units	From more affordable categories in 1998	In same affordability category in both years	From less affordable categories in 1998	2011 rental units non-rental in 1998
Non-market	22,700	NA	30.3%	23.8%	45.9%
Extremely low rent	2,900	8.0%	6.5%	63.4%	22.1%
Very low rent	33,000	17.4%	31.6%	16.0%	35.0%
Low rent	24,200	32.3%	21.3%	16.6%	29.9%
Moderate rent	41,100	26.0%	28.5%	10.4%	35.2%
High rent	7,500	40.8%	8.0%	0.0%	51.2%
Very high rent	1,200	31.8%	0.0%	0.0%	68.2%
Extremely high rent	2,700	29.0%	0.0%	NA	71.0%
Total	135,100	21.2%	25.9%	15.3%	37.6%

Of the 135,100 rental units in 2011, 37.6 percent were not rental in 1998 (50,800 units). The largest proportion of these gains was due to changes in tenure, with 30,400 rental units having been owner-occupied or vacant for sale in 1998. Another 2,700 units had been seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally, 17,800 rental units had not been in the housing stock in 1998. Of these, 16,900 were added by new construction and 900 by other means. Backward-Looking Rental Dynamics Table 2 shows how the movement into the rental stock varied across the affordability categories.

## **6. Summary of Housing Market Changes: Birmingham Metropolitan Area, 1998–2011**

In 1998 the Birmingham metropolitan area contained 394,100 housing units, including vacant units. By 2011 the number of housing units had increased to 502,000. Part of this increase was due to a redefinition of the metropolitan area that added three counties. We estimate that the 2011 count of housing units for the metropolitan area as defined in 1998 would be 444,900. This represents an overall increase of 12.9 percent, which translates to an average annual increase of 0.9 percent over the 13-year period.

The change in the geographical definition of Birmingham affects the interpretation of the information presented in this report. Our analysis applies only to that portion of the metropolitan area that was common to the Birmingham metropolitan area as defined in both 1998 and 2011.

Between 1998 and 2011, only 8,400 units left the housing stock. Of these, 4,700 are clearly permanent losses—the original unit is gone, and major construction would be required to replace it with a new unit. Another 800 are temporary losses—the original unit needs repairs or is being used for other purposes. These units may or may not return to the housing stock. Finally, there were 2,900 units that left the housing stock either permanently or temporarily for “other” reasons, a category that encompasses a wide variety of situations. Demolitions and natural disasters accounted for 3,800 of the permanent losses, while mergers and conversions contributed another 300 permanent losses. The 2011 AHS survey in Birmingham did track mobile home move-outs, which accounted for an additional 600 permanent losses.

In the period between the 1998 and 2011 AHS surveys, 110,100 units were added to the housing stock. Ninety-six percent of these additions were newly constructed units. The 2011 AHS did track move-ins of mobile homes in Birmingham, a factor accounting for 1,800 new units. Also, 400 new units were formed from the conversion or merger of 1998 units. We classified 1,400 units as recovered because these units had been in the housing stock at some point but were classified in 1998 as nonresidential (700) or uninhabitable (700). Finally, 600 units were added in other unclassified ways.

The Birmingham metropolitan area lost 2.1 percent of all 1998 housing units by 2011; additions between 1998 and 2011 represent 21.9 percent of the 2011 housing stock. Losses and additions varied across portions of the Birmingham housing market defined by the characteristics of the unit or its occupants. We observed the following patterns that were both atypical of the overall housing stock and statistically significant:

- More recently built units (1995–1999) had a low loss rate, while older units (1940–1949) had a high loss rate.
- Larger units appear to have lower loss rates (e.g., units with 7 rooms and units with 3 bedrooms).
- Among multifamily units, those in buildings with 3 floors had a low loss rate.

- Units reporting moderate heating problems in 1998 had a high loss rate.
- New additions were underrepresented among units that were vacant in 2011.
- The rate of addition varied by structure type. Single-family detached units had a higher-than-average rate of addition, and single-family attached units had a very high rate of addition. As a group, multifamily units had a low rate of addition; the rates of addition were particularly low for smaller multifamily buildings, those with 5 to 19 units and those with only 2 stories.
- Unit size mattered. Units with 3 or 4 rooms or 1 or 2 bedrooms had lower-than-average rates of addition; those with 8 rooms or 10 or more rooms or with 4 or more bedrooms had very high rates of addition.
- The rates of addition were low for units that reported severe or moderate physical problems. Plumbing deficiencies show up as a specific problem.
- Units occupied in 2011 by households with elderly householders (65 or older) had low rates of addition, while those occupied by householders younger than 65 had an above-average rate. Units occupied in 2011 by households with children had an above-average rate of addition, while those without children had a below-average rate.
- Units occupied by Black or Hispanic householders in 2011 had experienced lower-than-average rates of addition; those with White householders had experienced higher-than-average rates.
- The rate of addition among units that were renter-occupied in 2011 was substantially lower than that of all occupied units. Among renter-occupied units, addition rates clearly varied by monthly housing costs and household income in 2011. Those units with low housing costs (less than \$1,250) or occupied by lower income renters (less than \$50,000) had lower rates of additions while those with high housing cost (\$1,250 or more) and those occupied by high income renters (\$100,000 or more) had higher than average rates of additions.
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units. Among owner-occupied units, addition rates clearly varied by monthly housing costs and household income in 2011. Those occupied by lower income owners (less than \$30,000) and those with lower monthly housing costs (less than \$600) had lower-than-average rates of addition, while those occupied by higher income owners (\$50,000 or more) and those with high monthly housing costs (\$800 or more) had higher-than-average rates of addition.

The 1998 rental stock in Birmingham was on the borderline between being affordable and not being affordable. Of the 121,500 rental units in 1998, 41,600 were extremely low rent or very low rent units. In addition, 20,100 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 50.8 percent of the 1998 rental

stock. The three highest rent categories comprised 8.5 percent of the rental stock, but almost no units were in the very high rent or extremely high rent categories. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—25.8 percent of all 1998 units compared to 19.0 percent. By 2011, 23.2 percent of the 273,400 rental units in 1998 were no longer in the rental stock (28,200 units). The largest proportion of these losses was due to changes in tenure, with 18,500 rental units becoming owner-occupied or vacant for sale in 2011.

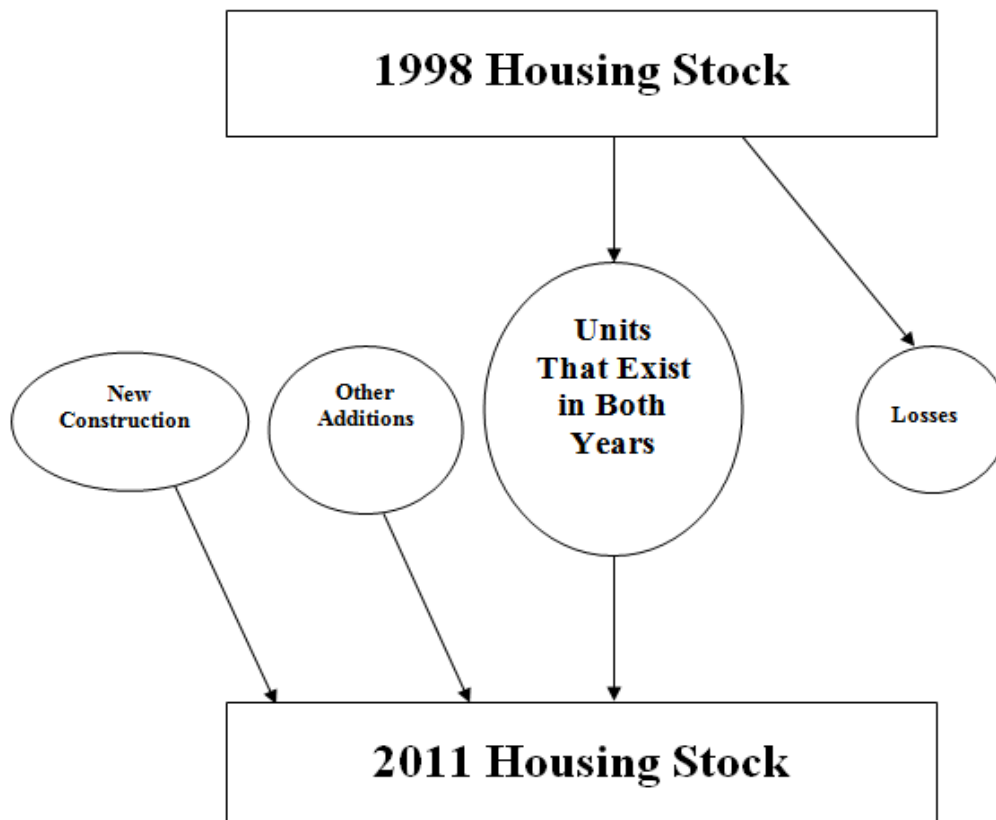
The rental stock in Birmingham was less affordable in 2011 than in 1998. Of the 135,100 rental units in 2011, 35,900 were extremely low rent or very low rent units. In addition, 22,700 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 43.4 percent of the 2011 rental stock. The three highest rent categories comprised 8.4 percent of the rental stock. Moves from a more affordable category (sometimes called gentrification) exceeded moves from a less affordable category (sometimes called filtration)—21.2 percent of all 2011 units compared to 15.3 percent. Of the 135,100 rental units in 2011, 37.6 percent were not rental in 1998 (50,800 units). The largest proportion of these gains was due to changes in tenure, with 30,400 rental units having been owner-occupied or vacant for sale in 1998.

## Appendix A: CINCH and Rental Dynamics Methodology

### Overview

Components of Inventory Change (CINCH) is a tool used by housing analysts to study how the housing inventory changes over time. Figure 1 illustrates how the inventory evolves.

**Figure A-1: How the Housing Inventory Changes**



In the context of Figure A-1, the U.S. Census Bureau provides estimates for both rectangles (the 1998 and 2011 housing stocks) and one oval (units added through new construction between 1998 and 2011). No one estimates the other three ovals: the number of units that belong to both the 1998 and 2011 housing stock, units lost to the housing stock between 1998 and 2011, and other additions to the housing stock between 1998 and 2011.

While losses and other additions are small relative to the overall stock, they encompass important features of how housing markets evolve. Housing units are “clumps” of physical capital associated with specific plots of land, and the housing inventory is the aggregation of these capital-land combinations. New construction creates new clumps, and—like all capital—some “clumps” depreciate and disappear. However, housing units undergo other interesting changes. Losses can be either permanent or temporary. Units destroyed by natural disasters or intentionally demolished are permanent losses. Temporary losses include units that are used for

nonresidential purposes and units that are uninhabitable because of structural defects that can be repaired. Additions can result from restoring units that were uninhabitable or converting nonresidential structures into residential structures.

In addition to determining the size of each oval, housing analysts find information about the characteristics of the units in the different ovals useful. Interesting characteristics include structure type, age of the unit, size of the unit, location by region, location by metropolitan status, tenure, household size and composition, resident income, and resident race and ethnicity.

CINCH analysis has three goals:<sup>12</sup>

- To provide an estimate for all six components of Figure A-1.
- To disaggregate losses and other additions into relevant component parts.
- To characterize the units that survive from one period to the next and the units that are added or lost between periods.

The AHS has four features that make CINCH analysis possible:

- Each unit has weights that can be used to estimate its share of the overall stock.
- The AHS tracks new construction and the various types of losses and other additions.
- The AHS has detailed information about the characteristics of each unit and its occupants.
- The AHS tracks the same unit from one period to the next so that changes in status and characteristics can be observed directly.

Housing analysts and policymakers are particularly interested in what happens to affordable rental housing units. Rental dynamics is a form of CINCH analysis that classifies the rental housing stock by affordability level and tracks the evolution of the rental housing stock by affordability class.

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<sup>12</sup> Previous CINCH analyses have distinguished between the “status” of a unit with respect to the housing stock (e.g., existing as a nonresidential structure) and the “characteristics” of the unit or its occupants (e.g., rental vs. owner-occupied, or race of householder). This report uses this same distinction. Also adopting previous CINCH terminology, Appendix A will refer to the more recent AHS survey year, 2011, as the current year and the previous AHS survey year, 1998, as the base year.

## Why the analysis needs to be separated into two components

It would be possible to list for every AHS sample unit its status and characteristics in both 1998 and 2011. In some cases, there may be no status, (e.g., not yet constructed in 1998) or no characteristics (e.g., no race of householder for vacant units), but with this understanding such a listing would still be possible. From the listing, one could construct an exact accounting of the movement of units among the various statuses and characteristics between 1998 and 2011.

The exact accounting would apply only to AHS sample observations, roughly a 1-in-500 picture of the housing stock at the metropolitan level. To obtain estimates of the magnitude of actual changes in the housing stock, one needs to apply weights to the sampled units. When weights are applied, the accounting will no longer be exact because units have different weights in different years.<sup>13</sup> For example, the exact accounting might show that 2,500 sample units that were rental in 1998 became owner-occupied or vacant for sale in 2011. To estimate the number of units in the national housing stock that were rental in 1998 and became owner-occupied in 2011, one would need to apply weights. However, using 1998 weights would produce a different estimate than using 2011 weights. There is no conceptual reason to favor the answer using 1998 weights over the answer using 2011 weights. The choice of weights depends upon how the intended analysis will be used.

For this reason, previous CINCH analyses have distinguished between:

1. *Forward-looking analysis*; that is, starting with the base-year stock (1998) and determining the status and characteristics of *those* units in the current year (2011). The goal is to explain what happened to the units comprising the housing stock in the base year. Forward-looking analysis takes the housing stock as given in the base year and looks at the destination of these units in the current year.
2. *Backward-looking analysis*; that is, starting from the current year (2011) stock and determining the status and characteristics of *those* units in the base year (1998). The goal here is to explain where the units comprising the current year housing stock came from. Backward-looking analysis takes the current-year housing stock as given and looks at the source of these units, either in the base year or in new construction or other additions.

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<sup>13</sup> The Census Bureau assigns both a pure weight (the inverse of the probability of selection) and a final weight to each AHS observation. The final weights are designed to sum up to independent estimates of the total housing stock. The pure weights will vary over observations within a given AHS survey because of stratification in drawing the sample. Generally, pure weights do not vary across survey years. The final weights will differ over observations within a given AHS because the Census Bureau makes adjustments for various factors affecting the sample. The final weights of a given observation will also vary between AHS surveys because of changes in the housing stock.



## Why changes in geography boundaries affect CINCH analysis

The analysis in this report applies only to that portion of the metropolitan area that was common to the metropolitan area as defined in both 1998 and 2011, and the application to the common area is not precise for the following reasons:

- For forward-looking analysis (1998 to 2011), we observe only those sample units in the geography common to both 1998 and 2011. Thus the observed changes correctly apply only to the common area. However, the forward-looking weights are based by necessity on the entire 1998 geography. Since the common area is smaller than the 1998 geography, the counts are overestimates for the common area.
- For the backward-looking analysis (2011 from 1998), we observe (a) sample units that were in the common area in 1998 and are still in the stock in 2011, (b) sample units representing additions to the stock throughout the metropolitan area as newly defined, and (c) sample units that represent housing existing in 1998 in the added portion of the metropolitan area. We can eliminate (c) and try to focus the analysis on the common area, but there are two problems. The backward-looking weights are based by necessity on the entire 2011 geography. Since the common area is smaller than the 2011 geography, the counts are overestimates for the common area. Moreover, we cannot determine which newly added sample units in (b) represent the common area and which represent the added portion of the metropolitan area. Therefore, additions are overestimated with respect to the common area.

## ***Appendix B: CINCH and Rental Dynamics Tables***

### **Contents**

This appendix contains 12 detailed CINCH and rental dynamics tables that have been featured in previous reports. There are:

- Four forward-looking CINCH tables that track changes to the 1998 housing stock in 2011 by various characteristics of the units or their occupants.
- Four backward-looking CINCH tables that track where the 2011 housing stock originated by various characteristics of the units or their occupants.
- Two forward-looking rental dynamics tables (one with counts and one with percentages) that track by affordability category what happened to the 1998 rental stock by 2011.
- Two backward-looking rental dynamics tables (one with counts and one with percentages) that track by affordability category where the 2011 rental stock came from with respect to 1998.

Appendix B begins with an explanation of how to read the tables.

### **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. All counts are rounded to the nearest hundred.

The forward-looking tables report what happened to the 1998 housing stock by 2011. There are three possible dispositions of 1998 units:

- Units that continue to exist in 2011 with the same characteristics (or serving the same market).
- Units that continue to exist in 2011 but with different characteristics (or serving a different market).
- Units that were lost to the stock in 2011.

The backward-looking tables report where the 2011 housing stock came from in reference to 1998. There are three possible sources of 2011 units:

- Units that existed in 1998 with the same characteristics (or serving the same market).

- Units that existed in 1998 but with different characteristics (or serving a different market).
- Units that are additions to the housing stock between 1998 and 2011.

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, which are identical for the same tables in the forward-looking and backward-looking sets. Columns A through D 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, occupied units or units built from 1990 through 1994.
- Column B gives the CINCH estimate of the number of units that satisfy two conditions: (a) being part of the housing stock in the relevant year (1998 for the forward-looking tables and 2011 for the backward-looking tables) and (b) satisfying the condition in column A.
- Column C is the CINCH estimate of the number of units from column B 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.
- Column D is the CINCH estimate of the number of units from column B 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. 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 characteristics are considered impossible or unlikely to change.

### ***Columns Unique to Forward-Looking Tables***

In the forward-looking tables, columns E through J track what happened to units that were lost from 1998 to 2011.

- Column E is the CINCH estimate of the number of units from column B that are not in the 2011 housing stock because they were merged with other units or converted into multiple units.
- Column F is the CINCH estimate of the number of houses or manufactured homes from column B that were moved out during the period. In most cases, these units were relocated rather than destroyed. The AHS considers them “losses” because a housing unit is a combination of land and capital, and a move breaks that specific combination to

create a new combination at a different location. For this reason, manufactured houses that move from one lot to another are treated as both losses and additions.<sup>14</sup>

- Column G is the CINCH estimate of the number of units from column B 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>15</sup>
- Column H is the CINCH estimate of the number of units from column B that were demolished or were destroyed by fires or natural disasters by 2011.
- Column I is the CINCH estimate of the number of units from column B that in 2011 were condemned or were no longer usable for housing because of extensive damage.
- Column J is the CINCH estimate of the number of units from column B that were lost by 2011 for other reasons.

The columns form a closed system. Column B counts the number of units tracked; columns C through J account for all the possible outcomes. Therefore, column B minus the sum of columns C through J always equals zero, except for rounding.

### ***Columns Unique to Backward-Looking Tables***

In backward-looking tables, columns E through J track where units came from that are part of the housing stock in 2011 but were not part of the 1998 housing stock.

- Column E is the CINCH estimate of the number of units from column B that were created by the merger or conversion of other units.
- Column F estimates the number of houses or mobile homes from column B that were moved in during the period. For many of the metropolitan areas in the 2011 AHS survey, information on movements was not collected.
- Column G is the CINCH estimate of the number of units from column B that had been nonresidential in 1998.
- Column H is the CINCH estimate of the number of units from column B that were newly constructed between 1998 and 2011. Note: Generally, in Backward-Looking Table A, there will be units in column H with year-built data substantially earlier than the survey year. There are three explanations for this apparent inconsistency. (1) With the exception of manufactured houses, presence in column H is determined by information from the

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<sup>14</sup> The AHS does not track what happens to a house or mobile home that is moved off of a lot that is part of the AHS sample, and does not inquire about the previous history of a unit that is moved on to a lot that is part of the AHS sample.

<sup>15</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. Nonresidential, therefore, means strictly no residential use.

Census Bureau indicating that the unit entered the sample from a listing of new construction; the Census Bureau may be mistaken. (2) Year built is based on information from the respondent; the respondent may be mistaken. (3) An older unit may have undergone substitution renovation that required a new construction permit, but the respondent may have given the original construction date rather than the renovation date. The extent of major renovation occurring in many established neighborhoods throughout the country makes (3) a likely possibility.

- Column I is the CINCH estimate of the number of units from column B that were added by 2011 from units that were structurally unsound in 1998.<sup>16</sup>
- Column J is the CINCH estimate of the number of units from column B that were added by 2011 from units that had been temporarily lost to the stock in 1998 for reasons “not classified” or were newly added by “other” means.

In some metropolitan areas, the AHS surveys do not report data for all the rows in the tables in this appendix. The columns for those rows are left blank.

### **How to read rental dynamics tables**

Forward-Looking Rental Dynamics Table 1 details by affordability category how the rental units in the 1998 housing stock relate to the 2011 housing stock. Column A estimates the number of units in each affordability category in 1998. Columns B through L explain where the 1998 rental units fit into the 2011 housing stock.

- If the units are still rental in 2011, they will be counted in columns B through I, depending upon how affordable they are in 2011.
- If the units have become owner-occupied or for vacant for sale, they will be counted in column J.
- Seasonal units, units that are not the primary residence of their occupants, units used for migratory workers, and units that are vacant but not for rent or sale are counted in column K.
- Column L counts 1998 units that are not in the 2011 housing stock; these can be either temporary or permanent losses to the stock.

The sum of columns B through L equals column A, except for rounding.

Forward-Looking Rental Dynamics Table 2 presents the same information as Table 1, but columns B through L are now percentages of column A. Columns B through L sum to 100 percent in each row.

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<sup>16</sup> These units had codes that identified them as “occupancy prohibited” or “interior exposed to the elements.”

Backward-Looking Rental Dynamics Table 1 details by affordability category where the rental units in the 2011 housing stock came from with respect to the 1998 housing stock. Column A estimates the number of units in each affordability category in 2011. Columns B through L explain where the 2011 rental units originated.

- If the units were rental in 1998, they will be counted in columns B through I, depending upon how affordable they are in 1998.
- If the units were owner-occupied or for vacant for sale, they will be counted in column J.
- Seasonal units, units that are not the primary residence of their occupants, units used for migratory workers, and units that are vacant but not for rent or sale in 1998 are counted in column K.
- Column L counts rental units that were newly constructed between 1998 and 2011.
- Column M counts rental units that were added to the housing stock after 1998 by other means.

The sum of columns B through M equals column A, except for rounding.

Backward-Looking Rental Dynamics Table 2 presents the same information as Table 1, but columns B through M are now percentages of column A. Columns B through M sum to 100 percent in each row.

These four Rental Dynamics Tables look only at the endpoints of the 13-year period; for example, a unit that is low rent in 1998 and moderate rent in 2011 might have been high rent, owned, or out of the stock at points in between the two surveys. These tables do not track the path of rental units between 1998 and 2011.

**Forward-Looking Table A: Housing Characteristics, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
1	Housing stock	394,100	385,700	0	300	600	200	3,800	500	2,900	1
	Occupancy status										
2	Occupied	358,800	305,300	46,700	0	500	200	3,000	400	2,500	2
3	Vacant	32,200	7,300	23,400	300	100	0	700	100	400	3
4	Seasonal	3,100	1,900	1,100	100	0	0	0	0	0	4
	Units in structure										
5	1, detached	284,300	278,300	0	0	300	200	2,800	500	2,200	5
6	1, attached	11,300	11,300	0	0	0	0	0	0	0	6
7	2 to 4	17,100	15,900	0	300	0	0	500	0	400	7
8	5 to 9	13,800	13,600	0	0	0	0	100	0	100	8
9	10 to 19	18,200	17,900	0	0	0	0	100	0	200	9
10	20 to 49	16,700	16,600	0	0	0	0	0	0	100	10
11	50 or more										11
12	Manufactured/mobile home	32,800	32,200	0	0	400	0	200	0	0	12

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/ merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
	Year built										
16	1995–1999	30,700	30,500	0	0	0	0	0	0	200	16
17	1990–1994	30,100	29,800	0	0	0	0	200	0	200	17
18	1985–1989	38,700	38,300	0	0	400	0	0	0	100	18
19	1980–1984	28,000	27,700	0	0	100	0	100	0	100	19
20	1975–1979	43,900	43,400	0	0	0	0	100	100	300	20
21	1970–1974	44,700	43,900	0	0	200	0	600	0	0	21
22	1960–1969	57,800	57,000	0	0	0	0	300	100	400	22
23	1950–1959	52,100	50,300	0	0	0	0	1,000	100	700	23
24	1940–1949	33,200	31,400	0	0	0	100	1,000	200	500	24
25	1930–1939	16,500	16,100	0	0	0	100	200	100	0	25
26	1920–1929	11,900	11,100	0	300	0	0	200	0	400	26
27	1919 or earlier	6,400	6,000	0	100	0	100	200	0	0	27
	Rooms										
28	1										28
29	2	1,800	200	1,500	100	0	0	0	0	0	29
30	3	22,600	12,300	9,800	0	0	0	100	100	400	30
31	4	77,300	40,100	34,300	100	500	0	1,400	0	900	31
32	5	92,700	45,000	45,500	100	200	100	1,000	200	600	32
33	6	78,000	35,900	41,000	0	0	100	700	100	300	33
34	7	49,900	20,300	28,900	0	0	0	400	100	300	34
35	8	34,200	13,200	20,700	0	0	0	200	100	0	35
36	9	19,500	4,800	14,500	0	0	0	100	0	200	36
37	10 or more	18,000	5,800	11,900	0	0	100	0	0	200	37



	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
	Bedrooms										
38	None	200	0	200	0	0	0	0	0	0	38
39	1	30,900	22,400	7,500	200	0	0	200	100	500	39
40	2	123,800	83,000	36,500	100	600	200	2,000	0	1,300	40
41	3	171,200	133,100	35,400	0	100	0	1,400	400	800	41
42	4 or more	68,000	45,800	21,800	0	0	100	200	0	200	42
43	Multiunit structures	65,700	64,000	0	300	0	0	700	0	700	43
	Stories in structure										
44	1	8,900	8,700	0	0	0	0	100	0	100	44
45	2	31,100	29,700	0	300	0	0	600	0	500	45
46	3	25,700	25,600	0	0	0	0	0	0	100	46
47	4 to 6										47
48	7 or more										48

**Forward-Looking Table B: Unit Quality, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
1	Occupied units	358,800	305,300	46,700	0	500	200	3,000	400	2,500	1
2	With complete kitchen	348,000	294,300	47,200	0	400	200	3,000	400	2,400	2
3	Lacking complete kitchen facilities	10,800	0	10,500	0	200	0	0	0	100	3
4	With complete plumbing	355,900	298,200	51,000	0	500	200	3,000	400	2,500	4
5	Lack some plumbing	2,900	0	2,800	0	0	0	100	0	0	5
6	No hot piped water										6
7	No bathtub/shower										7
8	No flush toilet	300	0	200	0	0	0	100	0	0	8
9	No exclusive use	2,600	0	2,600	0	0	0	0	0	0	9
	Water										
10	Public/private water	355,500	301,700	47,200	0	500	200	3,000	400	2,400	10
11	Well serving 1 to 5 units	3,300	900	2,300	0	0	0	0	0	200	11
12	Other water source										12
	Sewer										
13	Public sewer	222,100	178,800	39,500	0	0	200	1,900	200	1,600	13
14	Septic tank/cesspool	136,700	89,100	44,700	0	500	100	1,100	200	900	14
15	Other										15

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
16	Severe problems	4,800	200	4,500	0	0	0	100	0	0	16
17	Plumbing	2,900	0	2,800	0	0	0	100	0	0	17
18	Heating	1,500	0	1,500	0	0	0	0	0	0	18
19	Electric	200	0	200	0	0	0	0	0	0	19
20	Upkeep	600	0	600	0	0	0	0	0	0	20
21	Moderate problems	30,000	6,500	22,300	0	200	0	400	0	600	21
22	Plumbing	1,600	0	1,500	0	0	0	100	0	0	22
23	Heating	13,000	6,300	5,700	0	200	0	400	0	500	23
24	Kitchen	10,800	0	10,500	0	200	0	0	0	100	24
25	Upkeep	8,300	400	7,900	0	0	0	100	0	0	25

**Forward-Looking Table C: Occupant Characteristics, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
1	Occupied units	358,800	305,300	46,700	0	500	200	3,000	400	2,500	1
	Age of householder										
2	Under 65	286,400	199,900	81,000	0	500	200	2,300	400	2,100	2
3	65 to 74	38,700	1,900	36,100	0	0	0	600	0	200	3
4	75 or older	33,700	7,500	25,700	0	0	100	200	0	200	4
	Children in household										
5	Some	125,100	41,200	81,300	0	200	0	1,300	300	800	5
6	None	233,700	158,900	70,600	0	400	200	1,700	100	1,700	6
	Race and ethnicity										
7	White	277,500	210,200	63,100	0	500	200	1,600	200	1,700	7
8	Hispanic	2,900	1,000	1,800	0	0	0	100	0	0	8
9	Non-Hispanic	274,600	201,300	69,300	0	500	200	1,500	200	1,700	9
10	Black	77,000	52,200	22,100	0	0	100	1,400	300	900	10
11	Hispanic	600	200	400	0	0	0	100	0	0	11
12	Non-Hispanic	76,400	52,000	21,700	0	0	100	1,400	300	900	12
13	American Indian or Alaska Native alone	1,100	0	1,100	0	0	0	0	0	0	13
14	Asian or Pacific Islander	1,600	900	700	0	0	0	0	0	0	14
16	Other	1,700	0	1,700	0	0	0	0	0	0	16
17	Hispanic or Latino (any race)	4,500	1,700	2,600	0	0	0	200	0	0	17

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
	Income sources of families and primary individuals										
18	Wages and salaries	279,600	174,700	100,100	0	400	200	2,000	400	1,800	18
20	Dividends, interest, or rent	138,100	36,900	99,400	0	200	200	500	100	800	20
21	Public assistance or public welfare	14,900	800	13,300	0	0	100	500	100	100	21

**Forward-Looking Table D: Income and Housing Cost, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
1	Occupied units	358,800	305,300	46,700	0	500	200	3,000	400	2,500	1
	Tenure										
2	Owner-occupied	252,700	198,900	49,700	0	500	200	1,700	200	1,400	2
3	Homeownership rate	70.4%									3
4	Renter-occupied	106,100	68,900	34,500	0	0	100	1,400	200	1,100	4
	Renter monthly housing costs										
5	No cash rent	5,500	100	5,100	0	0	100	100	100	0	5
6	Less than \$350	19,000	2,800	15,100	0	0	0	600	100	400	6
7	\$350 to \$599	45,100	7,000	37,100	0	0	0	500	0	600	7
8	\$600 to \$799	27,900	3,200	24,500	0	0	0	100	0	100	8
9	\$800 to \$1,249	8,500	3,500	4,900	0	0	0	100	0	0	9
10	\$1,250 or more	0	0	0	0	0	0	0	0	0	10
	Renter household income										
11	Less than \$15,000	29,900	9,000	19,900	0	0	0	700	0	400	11
12	\$15,000 to \$29,999	28,900	5,200	22,900	0	0	0	400	100	300	12
13	\$30,000 to \$49,999	29,900	6,900	22,400	0	0	100	200	100	200	13
14	\$50,000 to \$99,999	15,500	1,400	13,800	0	0	0	100	0	200	14
15	\$100,000 or more	1,900	0	1,900	0	0	0	0	0	0	15

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 1998	1998 units present in 2011	Change in characteristics	1998 units lost due to conversion/merger	1998 house or mobile home moved out	1998 units changed to nonresidential use	1998 units lost through demolition or disaster	1998 units badly damaged or condemned	1998 units lost in other ways	Row
	Owner monthly housing costs										
16	Less than \$350	110,100	24,000	83,500	0	500	100	1,200	100	700	16
17	\$350 to \$599	55,000	9,100	45,400	0	100	0	200	100	200	17
18	\$600 to \$799	29,000	2,500	26,300	0	0	0	100	0	200	18
19	\$800 to \$1,249	38,600	9,100	29,000	0	0	100	200	100	100	19
20	\$1,250 or more	20,100	12,900	6,700	0	0	0	100	0	300	20
	Owner household income										
21	Less than \$15,000	42,800	8,000	33,500	0	200	100	700	0	300	21
22	\$15,000 to \$29,999	46,600	9,600	36,400	0	0	100	300	0	200	22
23	\$30,000 to \$49,999	49,600	8,300	40,400	0	300	0	300	200	200	23
24	\$50,000 to \$99,999	74,800	21,300	52,600	0	100	0	300	0	500	24
25	\$100,000 or more	38,900	14,600	24,000	0	0	0	0	100	200	25

**Backward-Looking Table A: Housing Characteristics, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
1	Housing stock	502,000	391,900	0	400	1,800	700	105,900	700	600	1
	Occupancy status										
2	Occupied	419,400	303,500	20,000	400	1,800	700	92,200	500	400	2
3	Vacant	76,000	7,800	55,700	0	0	0	12,100	200	200	3
4	Seasonal	6,600	2,000	3,000	0	0	0	1,500	0	0	4
	Units in structure										
5	1, detached	358,800	272,300	0	200	300	200	84,700	700	400	5
6	1, attached	15,300	9,900	0	0	0	0	5,400	0	0	6
7	2 to 4	16,800	13,600	0	200	0	0	2,800	0	200	7
8	5 to 9	17,600	16,300	0	0	0	0	1,300	0	0	8
9	10 to 19	22,200	20,900	0	0	0	0	1,400	0	0	9
10	20 to 49	17,800	15,600	0	0	0	0	2,200	0	0	10
11	50 or more	3,800	3,100	0	0	0	0	700	0	0	11
12	Manufactured/mobile home	49,700	40,300	0	0	1,400	500	7,400	0	0	12



	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
	Year built										
13	2010–2014	3,900	0	0	0	0	0	3,900	0	0	13
14	2005–2009	50,200	0	0	0	0	0	50,200	0	0	14
15	2000–2004	37,000	0	0	0	200	0	36,600	200	0	15
16	1995–1999	47,300	31,500	0	0	500	0	15,200	0	200	16
17	1990–1994	30,500	30,300	0	0	0	0	0	0	200	17
18	1985–1989	41,000	40,500	0	0	500	0	0	0	0	18
19	1980–1984	27,400	27,400	0	0	0	0	0	0	0	19
20	1975–1979	44,200	44,000	0	200	0	0	0	0	0	20
21	1970–1974	42,900	42,700	0	0	0	0	0	200	0	21
22	1960–1969	57,400	56,700	0	0	600	0	0	0	0	22
23	1950–1959	54,300	53,300	0	200	0	700	0	0	200	23
24	1940–1949	31,900	31,700	0	0	0	0	0	200	0	24
25	1930–1939	16,400	16,400	0	0	0	0	0	0	0	25
26	1920–1929	11,400	11,200	0	0	0	0	0	200	0	26
27	1919 or earlier	6,100	6,100	0	0	0	0	0	0	0	27

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
	Rooms										
28	1	400	0	0	0	0	0	200	200	0	28
29	2	1,000	200	600	0	0	0	200	0	0	29
30	3	20,600	10,900	7,900	0	0	0	1,800	0	0	30
31	4	77,800	38,900	29,900	400	500	700	6,800	200	400	31
32	5	121,300	47,100	47,200	0	500	0	26,300	200	0	32
33	6	115,100	37,400	51,100	0	800	0	25,800	0	0	33
34	7	80,400	21,100	39,300	0	0	0	19,900	200	0	34
35	8	47,400	13,400	20,800	0	0	0	13,000	0	200	35
36	9	19,800	4,900	10,000	0	0	0	4,900	0	0	36
37	10 or more	18,300	5,800	5,400	0	0	0	7,100	0	0	37
	Bedrooms										
38	None	600	0	200	0	0	0	200	200	0	38
39	1	30,400	20,000	8,200	0	0	0	2,200	0	0	39
40	2	124,200	81,300	27,000	400	600	700	13,600	200	400	40
41	3	244,100	138,300	48,500	0	1,100	0	55,900	200	0	41
42	4 or more	102,700	46,700	21,600	0	0	0	34,000	200	200	42
43	Multiunit structures	78,200	69,500	0	200	0	0	8,300	0	200	43
	Stories in structure										
44	1	11,800	10,200	0	0	0	0	1,400	0	200	44
45	2	35,300	31,900	0	200	0	0	3,200	0	0	45
46	3	28,400	24,700	0	0	0	0	3,800	0	0	46
47	4 to 6	800	800	0	0	0	0	0	0	0	47
48	7 or more	1,900	1,900	0	0	0	0	0	0	0	48

**Backward-Looking Table B: Unit Quality, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/ merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
1	Occupied units	419,400	303,500	20,000	400	1,800	700	92,200	500	400	1
2	With complete kitchen	416,800	294,000	27,500	400	1,800	700	91,800	300	400	2
3	Lacking complete kitchen facilities	2,600	0	2,000	0	0	0	400	200	0	3
4	With complete plumbing	414,500	296,800	22,000	400	1,800	700	92,000	500	400	4
5	Lack some plumbing	4,900	0	4,700	0	0	0	200	0	0	5
6	No hot piped water	700	0	700	0	0	0	0	0	0	6
7	No bathtub/shower	200	0	200	0	0	0	0	0	0	7
8	No flush toilet	400	0	400	0	0	0	0	0	0	8
9	No exclusive use	4,200	0	3,900	0	0	0	200	0	0	9
	Water										
10	Public/private water	416,200	299,900	21,200	400	1,800	700	91,400	500	400	10
11	Well serving 1 to 5 units	3,200	1,200	1,100	0	0	0	900	0	0	11
12	Other water source										12
	Sewer										
13	Public sewer	283,000	171,600	44,700	200	1,400	200	64,400	300	200	13
14	Septic tank/cesspool	136,400	93,000	14,200	200	300	500	27,900	200	200	14
15	Other										15

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
16	Severe problems	8,900	200	8,400	0	0	0	200	0	200	16
17	Plumbing	4,900	0	4,700	0	0	0	200	0	0	17
18	Heating	3,900	0	3,900	0	0	0	0	0	0	18
19	Electric										19
20	Upkeep	400	0	200	0	0	0	0	0	200	20
21	Moderate problems	14,500	6,500	7,200	0	0	0	700	200	0	21
22	Plumbing	1,200	0	1,100	0	0	0	200	0	0	22
23	Heating	7,700	6,300	1,400	0	0	0	0	0	0	23
24	Kitchen	2,600	0	2,000	0	0	0	400	200	0	24
25	Upkeep	5,700	500	5,100	0	0	0	100	0	0	25

**Backward-Looking Table C: Occupant Characteristics, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
1	Occupied units	419,400	303,500	20,000	400	1,800	700	92,200	500	400	1
	Age of householder										
2	Under 65	326,300	196,500	47,300	200	1,600	700	79,500	300	200	2
3	65 to 74	52,400	2,200	43,000	0	0	0	7,100	200	0	3
4	75 or older	40,700	7,300	27,100	200	200	0	5,700	0	200	4
	Children in household										
5	Some	126,400	41,300	46,200	0	1,000	0	38,000	0	0	5
6	None	293,000	156,500	79,500	400	800	700	54,200	500	400	6
	Race and ethnicity										
7	White	312,600	211,000	21,900	400	1,800	700	76,200	500	200	7
8	Hispanic	11,900	500	9,900	0	0	0	1,500	0	0	8
9	Non-Hispanic	300,800	202,700	19,900	400	1,800	700	74,700	500	200	9
10	Black	100,900	51,800	34,800	0	0	0	14,200	0	200	10
11	Hispanic	200	200	0	0	0	0	0	0	0	11
12	Non-Hispanic	100,700	51,600	34,800	0	0	0	14,200	0	200	12
13	American Indian or Alaska Native alone	900	0	700	0	0	0	200	0	0	13
14	Asian or Pacific Islander	4,600	900	2,100	0	0	0	1,600	0	0	14
16	Other	400	0	400	0	0	0	0	0	0	16
17	Hispanic or Latino (any race)	12,100	1,300	9,300	0	0	0	1,500	0	0	17

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
	Income sources of families and primary individuals										
18	Wages and salaries	298,300	172,000	47,100	200	1,600	700	76,200	300	200	18
20	Dividends, interest, or rent	83,800	37,400	25,400	0	300	0	20,800	0	0	20
21	Public assistance or public welfare	7,100	700	5,300	0	500	0	600	0	0	21

**Backward-Looking Table D: Income and Housing Cost, Birmingham**

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
1	Occupied units	419,400	303,500	20,000	400	1,800	700	92,200	500	400	1
	Tenure										
2	Owner-occupied	309,100	203,900	23,400	0	1,800	500	79,000	300	200	2
3	Homeownership rate	73.7%									3
4	Renter-occupied	110,300	60,900	35,200	400	0	200	13,300	200	200	4
	Renter monthly housing costs										
5	No cash rent	9,600	100	7,100	200	0	0	1,800	200	200	5
6	Less than \$350	5,400	2,400	2,800	0	0	0	200	0	0	6
7	\$350 to \$599	16,500	6,100	9,600	0	0	0	800	0	0	7
8	\$600 to \$799	28,700	2,800	23,500	200	0	200	2,000	0	0	8
9	\$800 to \$1,249	41,900	3,100	33,300	0	0	0	5,500	0	0	9
10	\$1,250 or more	8,200	0	5,200	0	0	0	3,000	0	0	10
	Renter household income										
11	Less than \$15,000	33,500	8,000	22,400	0	0	0	2,900	0	200	11
12	\$15,000 to \$29,999	29,300	4,600	21,900	400	0	0	2,200	200	0	12
13	\$30,000 to \$49,999	23,400	6,000	15,800	0	0	200	1,400	0	0	13
14	\$50,000 to \$99,999	18,600	1,300	12,700	0	0	0	4,600	0	0	14
15	\$100,000 or more	5,600	0	3,400	0	0	0	2,100	0	0	15

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 1998	Change in characteristics	2011 units added by conversion/merger	2011 house or mobile home moved in	2011 units added from nonresidential use	2011 units added by new construction	2011 units added from temporary losses in 1998 stock	2011 units added in other ways	Row
	Owner monthly housing costs										
16	Less than \$350	50,100	25,000	18,900	0	800	0	5,200	0	200	16
17	\$350 to \$599	62,300	9,500	43,000	0	1,000	0	8,900	0	0	17
18	\$600 to \$799	31,300	2,500	20,600	0	0	500	7,500	200	0	18
19	\$800 to \$1,249	73,200	9,200	43,500	0	0	0	20,400	0	0	19
20	\$1,250 or more	92,200	13,100	42,000	0	0	0	36,900	200	0	20
	Owner household income										
21	Less than \$15,000	37,300	8,900	22,900	0	500	0	4,900	0	200	21
22	\$15,000 to \$29,999	49,500	9,900	32,900	0	500	0	6,100	0	0	22
23	\$30,000 to \$49,999	57,600	9,200	33,900	0	600	500	13,400	0	0	23
24	\$50,000 to \$99,999	95,100	21,700	46,000	0	0	0	27,200	300	0	24
25	\$100,000 or more	69,600	14,700	27,300	0	200	0	27,400	0	0	25



**Forward-Looking Rental Dynamics Table 1: Counts, 1998–2011, Birmingham**

Affordability categories	A Total in 1998	B Non-market in 2011	C Extremely low rent in 2011	D Very low rent in 2011	E Low rent in 2011	F Moderate rent in 2011	G High rent in 2011	H Very high rent in 2011	I Extremely high rent in 2011	J Owner- occupied in 2011	K Seasonal or related vacant in 2011	L Lost to stock in 2011
Non-market	20,100	8,000	200	4,200	1,300	2,300	400	0	0	2,700	500	600
Extremely low rent	7,500	1,000	200	1,800	600	400	0	0	0	1,400	1,200	800
Very low rent	34,100	2,400	900	11,500	6,700	3,800	0	0	0	4,800	2,800	1,300
Low rent	20,000	1,700	0	2,800	5,500	5,400	500	200	200	2,700	500	500
Moderate rent	29,500	600	1,000	2,800	3,200	13,000	2,500	0	200	4,800	1,300	100
High rent	10,100	600	0	200	1,100	4,900	700	200	300	2,100	0	100
Very high rent	200	0	0	0	0	0	0	0	200	0	0	0
Extremely high rent	0	0	0	0	0	0	0	0	0	0	0	0
Total	121,500	14,300	2,300	23,300	18,400	29,800	4,100	400	900	18,500	6,300	3,400

**Forward-Looking Rental Dynamics Table 2: Row Percentages, 1998–2011, Birmingham**

Affordability categories	A Total in 1998	B Non-market in 2011	C Extremely low rent in 2011	D Very low rent in 2011	E Low rent in 2011	F Moderate rent in 2011	G High rent in 2011	H Very high rent in 2011	I Extremely high rent in 2011	J Owner- occupied in 2011	K Seasonal or related vacant in 2011	L Lost to stock in 2011
Non-market	20,100	39.7%	1.0%	20.8%	6.5%	11.4%	1.9%	0.0%	0.0%	13.5%	2.3%	3.0%
Extremely low rent	7,500	13.5%	2.6%	24.6%	7.8%	5.2%	0.0%	0.0%	0.0%	18.4%	16.5%	11.3%
Very low rent	34,100	7.0%	2.5%	33.9%	19.5%	11.1%	0.0%	0.0%	0.0%	14.0%	8.2%	3.7%
Low rent	20,000	8.6%	0.0%	13.9%	27.7%	27.0%	2.3%	1.1%	1.1%	13.6%	2.3%	2.5%
Moderate rent	29,500	2.0%	3.3%	9.6%	10.8%	44.0%	8.6%	0.0%	0.7%	16.4%	4.3%	0.4%
High rent	10,100	6.0%	0.0%	1.9%	10.7%	48.4%	6.5%	1.9%	2.6%	21.2%	0.0%	0.9%
Very high rent	200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Extremely high rent	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	121,500	11.8%	1.8%	19.2%	15.1%	24.5%	3.3%	0.3%	0.7%	15.3%	5.1%	2.8%

**Backward-Looking Rental Dynamics Table 1: Counts, 1998–2011, Birmingham**

Affordability categories	A Total in 2011	B Non- market in 1998	C Extremely low rent in 1998	D Very low rent in 1998	E Low rent in 1998	F Moderate rent in 1998	G High rent in 1998	H Very high rent in 1998	I Extremely high rent in 1998	J Owner- occupied in 1998	K Seasonal or related vacant in 1998	L New construction	M Added in other ways
Non-market	22,700	6,900	700	2,000	1,500	600	600	0	0	6,900	200	2,700	600
Extremely low rent	2,900	200	200	900	0	900	0	0	0	400	0	300	0
Very low rent	33,000	4,000	1,700	10,400	2,500	2,600	200	0	0	7,300	1,500	2,500	200
Low rent	24,200	1,100	600	6,100	5,100	3,100	900	0	0	5,000	100	1,900	200
Moderate rent	41,100	2,000	500	3,400	4,800	11,700	4,300	0	0	7,900	600	6,000	0
High rent	7,500	400	0	0	400	2,300	600	0	0	1,900	200	1,700	0
Very high rent	1,200	0	0	0	200	0	200	0	0	400	0	400	0
Extremely high rent	2,700	0	0	0	200	200	200	200	0	600	0	1,300	0
Total	135,100	14,600	3,700	22,900	14,600	21,300	6,900	200	0	30,400	2,700	16,900	900

**Backward-Looking Rental Dynamics Table 2: Row Percentages, 1998–2011, Birmingham**

Affordability categories	A Total in 2011	B Non- market in 1998	C Extremely low rent in 1998	D Very low rent in 1998	E Low rent in 1998	F Moderate rent in 1998	G High rent in 1998	H Very high rent in 1998	I Extremely high rent in 1998	J Owner- occupied in 1998	K Seasonal or related vacant in 1998	L New construction	M Added in other ways
Non-market	22,700	30.3%	3.3%	9.0%	6.6%	2.5%	2.5%	0.0%	0.0%	30.6%	0.8%	12.1%	2.4%
Extremely low rent	2,900	8.0%	6.5%	31.9%	0.0%	31.5%	0.0%	0.0%	0.0%	13.0%	0.0%	9.1%	0.0%
Very low rent	33,000	12.2%	5.2%	31.6%	7.5%	7.9%	0.7%	0.0%	0.0%	22.0%	4.7%	7.7%	0.6%
Low rent	24,200	4.6%	2.5%	25.2%	21.3%	12.7%	3.8%	0.0%	0.0%	20.8%	0.6%	7.7%	0.8%
Moderate rent	41,100	5.0%	1.1%	8.3%	11.6%	28.5%	10.4%	0.0%	0.0%	19.2%	1.4%	14.6%	0.0%
High rent	7,500	5.0%	0.0%	0.0%	5.0%	30.9%	8.0%	0.0%	0.0%	25.4%	3.0%	22.8%	0.0%
Very high rent	1,200	0.0%	0.0%	0.0%	15.9%	0.0%	15.9%	0.0%	0.0%	31.8%	0.0%	36.4%	0.0%
Extremely high rent	2,700	0.0%	0.0%	0.0%	6.9%	6.9%	6.9%	8.4%	0.0%	22.1%	0.0%	48.9%	0.0%
Total	135,100	10.8%	2.7%	16.9%	10.8%	15.8%	5.1%	0.2%	0.0%	22.5%	2.0%	12.5%	0.7%