

**American Housing Survey**

**Components of Inventory Change and  
Rental Dynamics Analysis:  
Milwaukee, 2002–2011**

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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 Milwaukee metropolitan area changed between 2002 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 Milwaukee and on their occupants in both 2002 and 2011.

In 2002 the Milwaukee metropolitan area contained 626,500 housing units, including vacant units. By 2011 the number of housing units had increased to 674,100. This was an overall increase of 7.6 percent, which translates to an average annual increase of 0.8 percent over the 9-year period. There were no changes to the definition of the metropolitan area between AHS surveys.

Between 2002 and 2011, only 5,000 units left the housing stock. Of these, 3,100 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 1,100 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 1,700 of the permanent losses, while mergers and conversions contributed another 1,400 permanent losses.

In the period between the 2002 and the 2011 AHS surveys, 76,000 units were added to the housing stock. Ninety-eight percent of these additions were newly constructed units. The 2011 AHS did not track move-ins of mobile homes in Milwaukee. No units were formed from the conversion or merger of 2002 units. We classified 900 units as recovered because these units had been in the housing stock at some point but were classified in 2002 as nonresidential (600) or uninhabitable (300). Finally, 700 units were added in other unclassified ways.

The Milwaukee metropolitan area lost 0.8 percent of all 2002 housing units by 2011; additions between 2002 and 2011 represented 11.3 percent of the 2011 housing stock. Losses and additions varied across portions of the Milwaukee housing market defined by the characteristics of the unit or its occupants. We observed the following patterns, which were both atypical of the overall housing stock and statistically significant:

- Owner-occupied units in 2002 with households earning \$100,000 or more had a loss rate half that of all occupied units.
- Single-family attached units experienced a high rate of addition.

- Small multifamily structures (2–4 units, 5–9 units, 2 stories) had lower-than-average rates of addition; units in large multifamily buildings (50+ units, 4 or more floors) had very high rates of addition.
- Smaller units (6 rooms) had low rates of addition, while larger units (8 rooms, 10 or more rooms, or 4 or more bedrooms) experienced high rates of addition.
- Additions were underrepresented among units with severe physical problems in 2011.
- Units with children in 2011 had a higher-than-average rate of addition, while those without children had a lower-than-average rate.
- The rate of addition was low among units that were renter-occupied in 2011. There appears to be no discernible relationship within rental units between the rate of addition and either monthly housing costs or household income in 2011.
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units but not statistically different. Among owner-occupied units, those occupied by lower income owners (less than \$15,000, \$30,000–\$49,999) and those with lower monthly housing costs (\$350–\$599) had lower rates of addition, while those occupied by high-income owners (\$100,000 or more) and those with high monthly housing costs (\$1,250 or more) had high rates of addition.

The 2002 rental stock in Milwaukee was affordable. Of the 237,400 rental units in 2002, 157,700 were extremely low rent or very low rent units. In addition, 33,900 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 80.7 percent of the 2002 rental stock. The three highest rent categories comprised only 2.3 percent of the rental stock. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—47.1 percent of all 2002 units compared to 5.7 percent. By 2011, 10.3 percent of the 237,400 rental units in 2002 were no longer in the rental stock. The largest proportion of these losses was due to changes in tenure.

The rental stock in Milwaukee was less affordable in 2011 than in 2002. Of the 240,200 rental units in 2011, 87,800 were extremely low rent or very low rent units. In addition, 29,700 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 48.9 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)—42.1 percent of all 2011 units compared to 5.1 percent. Of the 240,200 rental units in 2011, 19.8 percent were not rental in 2002. Changes in tenure and new construction were major sources of new rental units.

# Components of Inventory Change and Rental Dynamics Analysis: Milwaukee, 2002–2011

## 1. Introduction

This report describes how the housing stock in the Milwaukee metropolitan area changed between 2002 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 Milwaukee and on their occupants in both 2002 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 2002 units by 2011) and backward-looking analysis (where the 2011 units came from in terms of 2002).<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 Milwaukee.
- Section 3 explains the changes in the housing stock between 2002 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.
- Section 5 breaks the rental housing stock into eight affordability categories and tracks what happened to units in each of those categories between 2002 and 2011.

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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 6 summarizes the changes to the housing stock of the Milwaukee metropolitan area between 2002 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 2002–2011 period 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: Milwaukee**

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 2002 the Milwaukee metropolitan area contained 626,500 housing units, including vacant units. By 2011 the number of housing units had increased to 674,100. This was an overall increase of 7.6 percent, which translates to an average annual increase of 0.8 percent over the 9-year period. There were no changes to the definition of the metropolitan area between AHS surveys.

### **Sample size**

Both CINCH and rental dynamics require that, if a sample unit is in both the 2002 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 1,884 sample units that were common to the 2002 and 2011 AHS Milwaukee surveys and satisfied all the analytical requirements.<sup>4</sup> Between 2002 and 2011, 31 sample units in the common area meeting the

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<sup>4</sup> The 2002 AHS surveyed 4,823 units in the Milwaukee metropolitan area; 2,277 of these units were in the 2011 AHS public use file (PUF). Of the 2,546 sample units no longer in the survey, 505 were legitimate temporary or

analytical requirements were lost to the stock; thus, the forward-looking analysis is based on a maximum of 1,915 sample units. Between 2002 and 2011, 254 sample units meeting the analytical requirements were added to the AHS survey to represent additions to the stock; thus, the backward-looking analysis is based on a maximum of 2,138 sample units. In the forward-looking analysis, the average weight of a sample unit is approximately 327 units; in the backward-looking analysis, the average weight of a sample unit is approximately 315 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 Milwaukee, 9 years separate the 2011 sample from the 2002 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.

## ***3. Changes to the Housing Stock: 2002–2011***

### **Losses between 2002 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 2002 and 2011, only 5,000 units left the housing stock. Of these, 3,100 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

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permanent losses to the housing stock and were considered for the analysis. The remaining 2,041 cases are coded as “sample reduction for the current survey year” with no further explanation.

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stock. Finally, there were 1,100 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 2002 Milwaukee Housing Units in 2011<sup>5</sup>**

Present in 2002	626,500
2002 units present in 2011	621,500
<b>Units no longer in the stock</b>	<b>5,000</b>
2002 units lost due to conversion/merger	1,400
2002 house or mobile home moved out	0
2002 units lost through demolition or disaster	1,700
<b>Permanent losses</b>	<b>3,100</b>
2002 units changed to nonresidential use	800
2002 units badly damaged or condemned	0
<b>Temporary losses</b>	<b>800</b>
<b>2002 units lost in other ways</b>	<b>1,100</b>

Demolitions and natural disasters accounted for 1,700 of the permanent losses, while mergers and conversions contributed another 1,400 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. Unfortunately, the 2011 AHS survey in Milwaukee did not track mobile home move-outs, probably because the long time between surveys makes it difficult to determine whether the current mobile home was the same mobile home as in 2002.

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.

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 2002. For each subgroup, these tables detail how many of the 2002 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 2002–2011 period.

### **Additions between 2002 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 2002 and 2011.<sup>6</sup>

<sup>5</sup> Numbers may not add consistently due to rounding. Counts were rounded to the nearest hundred.

<sup>6</sup> Inconsistencies between Tables 1 and 2 result from a combination of (1) changes in control housing counts between censuses and (2) different weights.

**Table 2: Sources for 2011 Milwaukee Housing Stock<sup>7</sup>**

2011 housing stock	674,200
2011 units present in 2002	598,200
<b>Total additions to stock</b>	<b>76,000</b>
Units added by new construction	74,400
House or mobile home moved in	0
Units added by conversion/merger	0
<b>New or reconstructed units</b>	<b>74,400</b>
Units added from nonresidential use	600
Units added from temporary losses	300
<b>Recovered units</b>	<b>900</b>
<b>Units added in other ways</b>	<b>700</b>

In the period between the 2002 and the 2011 AHS surveys, 76,000 units were added to the housing stock. Ninety-eight percent of these additions were newly constructed units. The 2011 AHS did not track move-ins of mobile homes in Milwaukee. No units were formed from the conversion or merger of 2002 units.

We classified 900 units as recovered because these units had been in the housing stock at some point but were classified in 2002 as nonresidential (600) or uninhabitable (300). Finally, 700 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 2011, 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 2002–2011 period.

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

The Milwaukee metropolitan area lost 0.8 percent of all 2002 housing units by 2011, but the loss rate varied across sectors of the stock.

We examined all of the components of the 2002 Milwaukee 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

<sup>7</sup> Numbers may not add consistently due to rounding. Counts were rounded to the nearest hundred.

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 Milwaukee, 2002–2011<sup>8</sup>**

Characteristics	Present in 2002	Total lost	Percent lost
<i>Housing stock</i>	626,500	5,000	0.8%
<i>Occupancy status</i>			
Occupied	584,600	4,600	0.8%
Vacant	40,500	400	1.1%
<i>Tenure</i>			
Owner-occupied	371,500	1,500	0.4%
Renter-occupied	213,100	3,100	1.5%
<i>Owner household income</i>			
\$100,000 or more	93,600	400	0.4%***

\*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.

The very low overall loss rate, combined with our ability to identify only 31 sample units that had been lost and met the analytical criteria for inclusion in the analysis, led to our finding only one subgroup with a loss rate statistically different than its benchmark rate. Table 3 shows that owner-occupied units in 2002 with households earning \$100,000 or more had a loss rate half that of all occupied units.

The 76,000 additions reported in Table 2 represented 11.3 percent of the 2011 housing stock. The rate of addition varied by the characteristics of the housing. Additions represented 10.9 percent of occupied units.

We examined all of the components of the 2002 Milwaukee 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.

<sup>8</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 4: Sectors Experiencing Atypical Rates of Addition in Milwaukee, 2002–2011<sup>9</sup>**

Characteristics	Present in 2011	Total additions	Percent additions
<i>Housing stock</i>	674,200	76,000	11.3%
<i>Occupancy status</i>			
Occupied	627,900	68,700	10.9%
Vacant	45,600	7,300	16.0%
<i>Units in structure</i>			
1, attached	29,000	6,000	20.9%**
2 to 4	120,100	7,300	6.1%***
5 to 9	54,000	3,200	6.0%***
50 or more	28,000	9,800	35.0%***
<i>Rooms</i>			
6	121,100	10,100	8.4%*
8	59,000	9,600	16.3%*
10 or more	18,800	5,500	29.5%***
<i>Bedrooms</i>			
4 or more	115,100	21,000	18.2%***
<i>Stories in structure (multifamily)</i>			
2	119,300	7,400	6.2%***
4 to 6	19,500	6,000	30.9%***
7 or more	3,000	2,700	91.2%***
<i>Severe problems</i>	9,800	300	3.5%**
<i>Children in household</i>			
Some	198,000	29,800	15.0%***
None	429,900	38,900	9.1%*
<i>Tenure</i>			
Owner-occupied	405,200	50,900	12.6%
Renter-occupied	222,700	17,800	8.0%**
<i>Renter monthly housing costs</i>			
\$350 to \$599	24,700	1,500	6.1%*
\$600 to \$799	68,500	2,100	3.1%***
<i>Renter household income</i>			
\$30,000 to \$49,999	44,600	2,400	5.5%***
\$100,000 or more	8,300	300	3.6%***
<i>Owner monthly housing costs</i>			
\$350 to \$599	56,800	3,100	5.5%***
\$1,250 or more	205,000	36,400	17.8%*
<i>Owner household income</i>			
Less than \$15,000	24,400	1,200	5.1%**
\$30,000 to \$49,999	67,400	4,500	6.7%**
\$100,000 or more	129,600	27,600	21.3%***

\*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 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.

The results reported in Table 4 characterize the changes in the Milwaukee housing stock.

- Single-family attached units experienced a high rate of addition.
- Small multifamily structures (2–4 units, 5–9 units, 2 stories) had lower-than-average rates of addition; units in large multifamily buildings (50+ units, 4 or more floors) had very high rates of addition.
- Smaller units (6 rooms) had low rates of addition, while larger units (8 rooms, 10 or more rooms, or 4 or more bedrooms) experienced high rates of addition.
- Additions were underrepresented among units with severe physical problems in 2011.
- Units with children in 2011 had a higher-than-average rate of addition, while those without children had a lower-than-average rate.
- The rate of addition was low among units that were renter-occupied in 2011. There appears to be no discernible relationship within rental units between the rate of addition and either monthly housing costs or household income in 2011.
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units but not statistically different. Among owner-occupied units, those occupied by lower income owners (less than \$15,000, \$30,000–\$49,999) and those with lower monthly housing costs (\$350–\$599) had lower rates of addition, while those occupied by high-income owners (\$100,000 or more) and those with high monthly housing costs (\$1,250 or more) had high rates of addition.

## **5. Rental Market Dynamics: 2002–2011**

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>10</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 2002 rental units by how affordable they were in 2002. 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 Milwaukee**

Affordability categories	2002 rental units	To more affordable categories in 2011	In same affordability category in both years	To less affordable categories in 2011	2002 rental units non-rental in 2011
Non-market	33,900	NA	44.8%	46.6%	8.6%
Extremely low rent	21,400	4.7%	9.0%	71.0%	15.3%
Very low rent	136,300	4.9%	45.7%	41.2%	8.2%
Low rent	30,400	14.6%	11.8%	60.5%	13.1%
Moderate rent	9,900	8.3%	38.4%	33.5%	19.9%
High rent	3,700	8.2%	27.7%	47.7%	16.4%
Very high rent	1,500	0.0%	0.0%	69.0%	31.0%
Extremely high rent	300	100.0%	0.0%	NA	0.0%
Total	237,400	5.7%	37.0%	47.1%	10.3%

The 2002 rental stock in Milwaukee was affordable. Of the 237,400 rental units in 2002, 157,700 were extremely low rent or very low rent units. In addition, 33,900 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 80.7 percent of the 2002 rental stock. The three highest rent categories comprised only 2.3 percent of the rental stock. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—47.1 percent of all 2002 units compared to 5.7 percent.

<sup>10</sup> Gross rent is equal to rent plus utilities.

By 2011, 10.3 percent of the 237,400 rental units in 2002 were no longer in the rental stock (24,500 units). The largest proportion of these losses was due to changes in tenure, with 15,000 rental units becoming owner-occupied or vacant for sale in 2011. Another 6,100 units became seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally, 3,200 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 2002, 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 Milwaukee was less affordable in 2011 than in 2002. Of the 240,200 rental units in 2011, 87,800 were extremely low rent or very low rent units. In addition, 29,700 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 48.9 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)—42.1 percent of all 2011 units compared to 5.1 percent.

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

Affordability categories	2011 rental units	From more affordable categories in 2002	In same affordability category in both years	From less affordable categories in 2002	2011 rental units non-rental in 2002
Non-market	29,700	NA	47.8%	22.1%	30.2%
Extremely low rent	6,300	16.5%	27.8%	33.3%	22.3%
Very low rent	81,500	19.5%	68.3%	3.4%	8.8%
Low rent	57,900	76.5%	5.4%	0.4%	17.7%
Moderate rent	44,700	68.3%	7.8%	0.7%	23.1%
High rent	9,000	39.1%	11.2%	0.0%	49.7%
Very high rent	5,100	26.1%	0.0%	6.6%	67.3%
Extremely high rent	6,000	75.6%	0.0%	NA	24.4%
Total	240,200	42.1%	33.0%	5.1%	19.8%

Of the 240,200 rental units in 2011, 19.8 percent were not rental in 2002 (47,500 units). The largest proportion of these gains was due to changes in tenure, with 21,400 rental units having been owner-occupied or vacant for sale in 2002. Another 5,000 units had been seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally, 21,000 rental units had not been in the housing stock in 2002. Of these 19,900 were added by new construction and 1,100 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: Milwaukee Metropolitan Area, 2002–2011**

In 2002 the Milwaukee metropolitan area contained 626,500 housing units, including vacant units. By 2011 the number of housing units had increased to 674,100. This was an overall increase of 7.6 percent, which translates to an average annual increase of 0.8 percent over the 9-year period. There were no changes to the definition of the metropolitan area between AHS surveys.

Between 2002 and 2011, only 5,000 units left the housing stock. Of these, 3,100 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 1,100 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 1,700 of the permanent losses, while mergers and conversions contributed another 1,400 permanent losses. The 2011 AHS survey in Milwaukee did not track mobile home move-outs.

In the period between the 2002 and the 2011 AHS surveys, 76,000 units were added to the housing stock. Ninety-eight percent of these additions were newly constructed units. The 2011 AHS did not track move-ins of mobile homes in Milwaukee. No units were formed from the conversion or merger of 2002 units. We classified 900 units as recovered because these units had been in the housing stock at some point but were classified in 2002 as nonresidential (600) or uninhabitable (300). Finally, 700 units were added in other unclassified ways.

The Milwaukee metropolitan area lost 0.8 percent of all 2002 housing units by 2011; additions between 2002 and 2011 represented 11.3 percent of the 2011 housing stock. Losses and additions varied across portions of the Milwaukee housing market defined by the characteristics of the unit or its occupants. We observed the following patterns, which were both atypical of the overall housing stock and statistically significant:

- Owner-occupied units in 2002 with households earning \$100,000 or more had a loss rate half that of all occupied units.
- Single-family attached units experienced a high rate of addition.
- Small multifamily structures (2–4 units, 5–9 units, 2 stories) had lower-than-average rates of addition; units in large multifamily buildings (50+ units, 4 or more floors) had very high rates of addition.
- Smaller units (6 rooms) had low rates of addition, while larger units (8 rooms, 10 or more rooms, or 4 or more bedrooms) experienced high rates of addition.
- Additions were underrepresented among units with severe physical problems in 2011.



- Units with children in 2011 had a higher-than-average rate of addition, while those without children had a lower-than-average rate.
- The rate of addition was low among units that were renter-occupied in 2011. There appears to be no discernible relationship within rental units between the rate of addition and either monthly housing costs or household income in 2011.
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units but not statistically different. Among owner-occupied units, those occupied by lower income owners (less than \$15,000, \$30,000–\$49,999) and those with lower monthly housing costs (\$350–\$599) had lower rates of addition, while those occupied by high-income owners (\$100,000 or more) and those with high monthly housing costs (\$1,250 or more) had high rates of addition.

The 2002 rental stock in Milwaukee was affordable. Of the 237,400 rental units in 2002, 157,700 were extremely low rent or very low rent units. In addition, 33,900 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 80.7 percent of the 2002 rental stock. The three highest rent categories comprised only 2.3 percent of the rental stock. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—47.1 percent of all 2002 units compared to 5.7 percent. By 2011, 10.3 percent of the 237,400 rental units in 2002 were no longer in the rental stock (24,500 units). The largest proportion of these losses was due to changes in tenure, with 15,000 rental units becoming owner-occupied or vacant for sale in 2011.

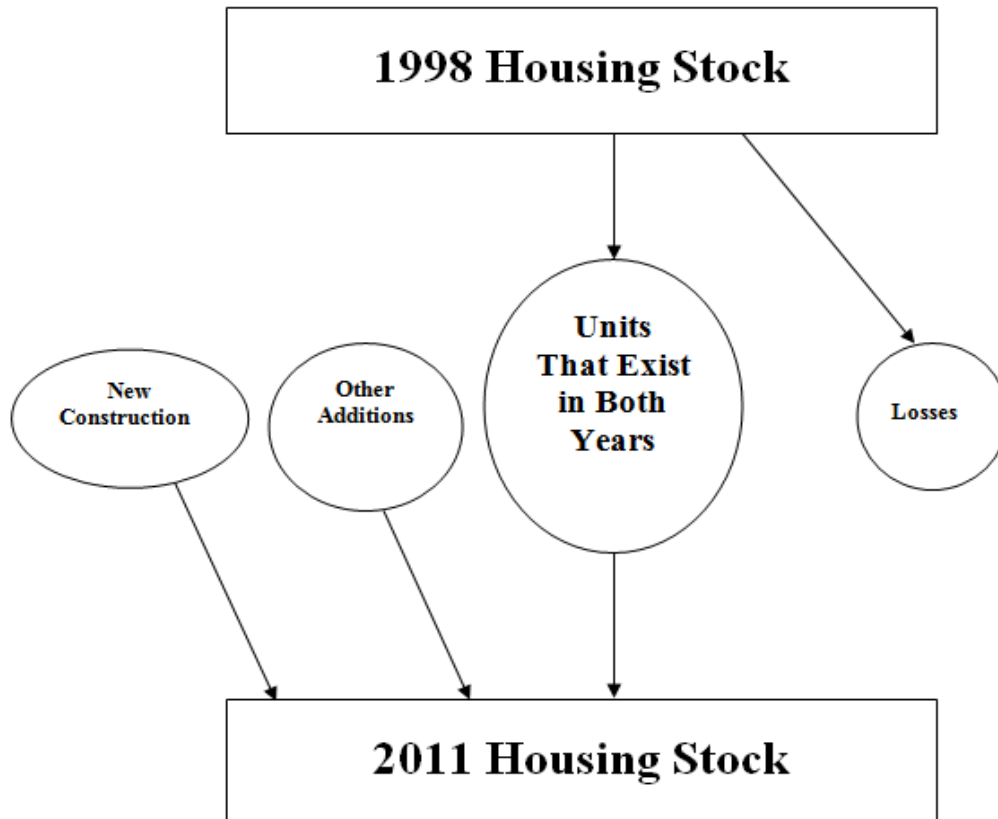
The rental stock in Milwaukee was less affordable in 2011 than in 2002. Of the 240,200 rental units in 2011, 87,800 were extremely low rent or very low rent units. In addition, 29,700 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 48.9 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)—42.1 percent of all 2011 units compared to 5.1 percent. Of the 240,200 rental units in 2011, 19.8 percent were not rental in 2002 (47,500 units). Changes in tenure (21,400 units) and new construction (19,900 units) were major sources of new rental units.

## 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 2002 and 2011 housing stocks) and one oval (units added through new construction between 2002 and 2011). No one estimates the other three ovals: the number of units that belong to both the 2002 and 2011 housing stock, units lost to the housing stock between 2002 and 2011, and other additions to the housing stock between 2002 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>11</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>11</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, 2002, 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 2002 and 2011. In some cases, there may be no status, (e.g., not yet constructed in 2002) 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 2002 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>12</sup> For example, the exact accounting might show that 2,500 sample units that were rental in 2002 became owner-occupied or vacant for sale in 2011. To estimate the number of units in the national housing stock that were rental in 2002 and became owner-occupied in 2011, one would need to apply weights. However, using 2002 weights would produce a different estimate than using 2011 weights. There is no conceptual reason to favor the answer using 2002 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 (2002) 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 (2002). 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>12</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 2002 and 2011, and the application to the common area is not precise for the following reasons:

- For forward-looking analysis (2002 to 2011), we observe only those sample units in the geography common to both 2002 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 2002 geography. Since the common area is smaller than the 2002 geography, the counts are overestimates for the common area.
- For the backward-looking analysis (2011 from 2002), we observe (a) sample units that were in the common area in 2002 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 2002 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 2002 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 2002 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 2002.

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 2002 housing stock by 2011. There are three possible dispositions of 2002 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 2002. There are three possible sources of 2011 units:

- Units that existed in 2002 with the same characteristics (or serving the same market).

- Units that existed in 2002 but with different characteristics (or serving a different market).
- Units that are additions to the housing stock between 2002 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 (2002 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 2002 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>13</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>14</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 2002 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 2002.
- Column H is the CINCH estimate of the number of units from column B that were newly constructed between 2002 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>13</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>14</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 2002.<sup>15</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 2002 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 2002 housing stock relate to the 2011 housing stock. Column A estimates the number of units in each affordability category in 2002. Columns B through L explain where the 2002 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 2002 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>15</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 2002 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 2002, they will be counted in columns B through I, depending upon how affordable they are in 2002.
- 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 2002 are counted in column K.
- Column L counts rental units that were newly constructed between 2002 and 2011.
- Column M counts rental units that were added to the housing stock after 2002 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 9-year period; for example, a unit that is low rent in 2002 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 2002 and 2011.

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

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	Row
1	Housing stock	626,500	621,500	0	1,400	0	800	1,700	0	1,100	1
	Occupancy status										
2	Occupied	584,600	545,800	34,300	1,100	0	700	1,700	0	1,100	2
3	Vacant	40,500	7,100	33,000	300	0	100	0	0	0	3
4	Seasonal	1,400	800	600	0	0	0	0	0	0	4
	Units in structure										
5	1, detached	333,500	331,800	0	100	0	200	1,100	0	300	5
6	1, attached	42,000	41,100	0	100	0	100	500	0	200	6
7	2 to 4	120,200	118,900	0	900	0	200	0	0	200	7
8	5 to 9	49,300	49,100	0	0	0	0	100	0	0	8
9	10 to 19	24,900	24,400	0	100	0	0	0	0	300	9
10	20 to 49	35,800	35,500	0	200	0	100	0	0	0	10
11	50 or more	17,600	17,400	0	0	0	200	0	0	0	11
12	Manufactured/mobile home	3,300	3,300	0	0	0	0	0	0	0	12

Row	A Characteristics	B Present in 2002	C 2002 units present in 2011	D Change in characteristics	E 2002 units lost due to conversion/ merger	F 2002 house or mobile home moved out	G 2002 units changed to nonresidential use	H 2002 units lost through demolition or disaster	I 2002 units badly damaged or condemned	J 2002 units lost in other ways	Row
	Year built										
15	2000–2004	20,400	20,400	0	0	0	0	0	0	0	15
16	1995–1999	36,400	36,100	0	0	0	300	0	0	0	16
17	1990–1994	57,500	57,300	0	0	0	0	0	0	200	17
18	1985–1989	33,100	32,800	0	0	0	0	0	0	300	18
19	1980–1984	24,400	24,400	0	0	0	0	0	0	0	19
20	1975–1979	59,600	59,500	0	0	0	0	0	0	100	20
21	1970–1974	59,100	58,700	0	200	0	200	0	0	0	21
22	1960–1969	102,100	101,900	0	100	0	100	0	0	0	22
23	1950–1959	97,000	96,200	0	200	0	0	600	0	0	23
24	1940–1949	32,400	32,100	0	100	0	0	200	0	0	24
25	1930–1939	46,100	45,400	0	300	0	0	200	0	200	25
26	1920–1929	24,600	24,200	0	200	0	200	0	0	0	26
27	1919 or earlier	34,000	32,700	0	300	0	0	700	0	300	27
	Rooms										
28	1	600	0	600	0	0	0	0	0	0	28
29	2	2,700	1,800	700	0	0	200	0	0	0	29
30	3	52,200	39,000	12,200	600	0	0	0	0	300	30
31	4	138,100	96,800	40,200	200	0	100	400	0	300	31
32	5	138,700	78,300	59,200	400	0	200	300	0	200	32
33	6	116,900	56,500	59,800	100	0	0	400	0	0	33
34	7	72,900	30,100	42,300	0	0	0	400	0	200	34
35	8	51,500	16,900	34,400	0	0	200	0	0	0	35
36	9	22,900	7,900	14,900	0	0	0	0	0	0	36
37	10 or more	30,200	6,300	23,500	100	0	100	200	0	0	37

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	Row
	Bedrooms										
38	None	3,100	1,100	2,000	0	0	0	0	0	0	38
39	1	68,800	57,700	9,400	800	0	200	200	0	500	39
40	2	202,700	182,100	19,700	0	0	300	300	0	200	40
41	3	256,700	226,300	28,800	500	0	100	800	0	100	41
42	4 or more	95,100	78,100	16,300	100	0	200	400	0	200	42
43	Multiunit structures	247,800	245,300	0	1,200	0	500	100	0	500	43
	Stories in structure										
44	1	6,400	6,200	0	200	0	0	0	0	0	44
45	2	129,800	128,600	0	200	0	400	0	0	500	45
46	3	97,600	96,500	0	800	0	100	100	0	0	46
47	4 or more	14,000	14,000	0	0	0	0	0	0	0	47

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

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	Row
1	Occupied units	584,600	545,800	34,300	1,100	0	700	1,700	0	1,100	1
2	With complete kitchen	561,400	504,300	52,900	1,000	0	500	1,700	0	1,100	2
3	Lacking complete kitchen facilities	23,200	2,000	20,900	200	0	200	0	0	0	3
4	With complete plumbing	579,300	534,000	40,800	1,100	0	700	1,700	0	1,100	4
5	Lack some plumbing	5,300	600	4,700	0	0	0	0	0	0	5
6	No hot piped water										6
7	No bathtub/shower										7
8	No flush toilet	400	0	400	0	0	0	0	0	0	8
9	No exclusive use	4,900	600	4,300	0	0	0	0	0	0	9
	Water										
10	Public/private water	478,300	444,200	31,000	1,000	0	500	600	0	900	10
11	Well serving 1 to 5 units	105,400	95,800	8,100	100	0	200	1,100	0	200	11
12	Other water source	900	0	900	0	0	0	0	0	0	12
	Sewer										
13	Public sewer	514,600	477,500	33,400	1,000	0	500	1,200	0	900	13
14	Septic tank/cesspool	70,000	61,200	7,900	100	0	200	500	0	200	14
15	Other										15

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	Row
16	Severe problems	9,500	600	8,900	0	0	0	0	0	0	16
17	Plumbing	5,300	600	4,700	0	0	0	0	0	0	17
18	Heating	3,900	0	3,900	0	0	0	0	0	0	18
19	Electric										19
20	Upkeep	300	0	300	0	0	0	0	0	0	20
21	Moderate problems	28,600	2,600	25,700	200	0	200	0	0	0	21
22	Plumbing	400	0	400	0	0	0	0	0	0	22
23	Heating										23
24	Kitchen	23,200	2,000	20,900	200	0	200	0	0	0	24
25	Upkeep	6,200	0	6,200	0	0	0	0	0	0	25

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

Row	A	B	C	D	E	F	G	H	I	J	Row
	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	
1	Occupied units	584,600	545,800	34,300	1,100	0	700	1,700	0	1,100	1
	Age of householder										
2	Under 65	454,300	367,700	82,800	800	0	500	1,400	0	1,100	2
3	65 to 74	64,500	8,100	56,000	100	0	0	300	0	0	3
4	75 or older	65,900	29,000	36,500	200	0	200	0	0	0	4
	Children in household										
5	Some	190,300	93,300	95,200	300	0	400	800	0	300	5
6	None	394,300	300,000	91,600	800	0	300	900	0	800	6
	Race and ethnicity										
7	White	528,800	462,300	63,000	1,000	0	500	1,100	0	1,000	7
8	Hispanic	9,200	4,200	4,700	0	0	0	0	0	300	8
9	Non-Hispanic	519,600	441,200	75,200	1,000	0	500	1,100	0	600	9
10	Black	34,900	25,000	8,900	100	0	200	600	0	100	10
11	Hispanic										11
12	Non-Hispanic	34,900	24,500	9,300	100	0	200	600	0	100	12
13	American Indian or Alaska Native alone	2,300	300	1,900	0	0	0	0	0	0	13
14	Asian or Pacific Islander	6,800	2,500	4,300	0	0	0	0	0	0	14
16	Other	11,800	0	11,800	0	0	0	0	0	0	16
17	Hispanic or Latino (any race)	18,000	6,700	10,900	0	0	0	0	0	300	17



	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	Row
	Income sources of families and primary individuals										
18	Wages and salaries	474,000	357,200	113,500	800	0	200	1,300	0	1,100	18
20	Dividends, interest, or rent	321,400	108,300	211,100	600	0	500	500	0	400	20
21	Public assistance or public welfare	15,500	1,600	13,500	0	0	0	200	0	200	21

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

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	Row
1	Occupied units	584,600	545,800	34,300	1,100	0	700	1,700	0	1,100	1
	Tenure										
2	Owner-occupied	371,500	335,400	34,700	400	0	300	300	0	500	2
3	Homeownership rate	63.5%									3
4	Renter-occupied	213,100	180,500	29,500	800	0	400	1,400	0	500	4
	Renter monthly housing costs										
5	No cash rent	2,600	900	1,700	0	0	0	0	0	0	5
6	Less than \$350	15,400	4,800	9,800	200	0	0	600	0	0	6
7	\$350 to \$599	56,200	11,700	43,600	300	0	200	200	0	200	7
8	\$600 to \$799	81,600	32,700	48,400	0	0	0	200	0	300	8
9	\$800 to \$1,249	52,200	28,400	23,200	200	0	0	400	0	0	9
10	\$1,250 or more	5,000	4,100	700	0	0	200	0	0	0	10
	Renter household income										
11	Less than \$15,000	39,800	14,200	25,000	0	0	0	500	0	0	11
12	\$15,000 to \$29,999	54,300	13,100	39,900	600	0	200	100	0	400	12
13	\$30,000 to \$49,999	55,500	13,000	41,100	100	0	200	800	0	200	13
14	\$50,000 to \$99,999	56,700	17,800	39,000	0	0	0	0	0	0	14
15	\$100,000 or more	6,800	1,000	5,800	0	0	0	0	0	0	15

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2002	2002 units present in 2011	Change in characteristics	2002 units lost due to conversion/merger	2002 house or mobile home moved out	2002 units changed to nonresidential use	2002 units lost through demolition or disaster	2002 units badly damaged or condemned	2002 units lost in other ways	Row
	Owner monthly housing costs										
16	Less than \$350	23,800	1,400	22,400	0	0	0	0	0	0	16
17	\$350 to \$599	87,200	28,300	58,600	100	0	200	0	0	0	17
18	\$600 to \$799	40,000	8,300	31,300	0	0	0	200	0	200	18
19	\$800 to \$1,249	95,200	27,700	67,100	300	0	0	0	0	100	19
20	\$1,250 or more	125,300	87,500	37,300	0	0	100	200	0	200	20
	Owner household income										
21	Less than \$15,000	22,500	3,500	18,700	100	0	0	200	0	0	21
22	\$15,000 to \$29,999	38,900	10,600	28,200	0	0	0	0	0	100	22
23	\$30,000 to \$49,999	64,900	14,200	50,500	100	0	100	0	0	0	23
24	\$50,000 to \$99,999	151,600	59,900	91,100	200	0	200	0	0	200	24
25	\$100,000 or more	93,600	44,900	48,400	0	0	0	200	0	200	25

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

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
1	Housing stock	674,200	598,200	0	0	0	600	74,400	300	700	1
	Occupancy status										
2	Occupied	627,900	526,500	32,700	0	0	600	67,800	0	300	2
3	Vacant	45,600	6,900	31,400	0	0	0	6,500	300	500	3
4	Seasonal	700	400	300	0	0	0	0	0	0	4
	Units in structure										
5	1, detached	369,900	328,600	0	0	0	0	40,500	0	700	5
6	1, attached	29,000	22,900	0	0	0	200	5,900	0	0	6
7	2 to 4	120,100	112,700	0	0	0	300	6,800	300	0	7
8	5 to 9	54,000	50,700	0	0	0	0	3,200	0	0	8
9	10 to 19	30,400	28,000	0	0	0	0	2,300	0	0	9
10	20 to 49	38,600	32,600	0	0	0	0	6,000	0	0	10
11	50 or more	28,000	18,200	0	0	0	200	9,600	0	0	11
12	Manufactured/mobile home	4,400	4,400	0	0	0	0	0	0	0	12

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
	Year built										
13	2010–2014	4,600	0	0	0	0	0	4,600	0	0	13
14	2005–2009	36,600	300	0	0	0	0	36,300	0	0	14
15	2000–2004	42,800	20,300	0	0	0	0	22,500	0	0	15
16	1995–1999	45,900	35,000	0	0	0	0	10,900	0	0	16
17	1990–1994	55,600	55,600	0	0	0	0	0	0	0	17
18	1985–1989	32,600	32,600	0	0	0	0	0	0	0	18
19	1980–1984	23,500	23,500	0	0	0	0	0	0	0	19
20	1975–1979	57,500	57,200	0	0	0	300	0	0	0	20
21	1970–1974	58,300	58,300	0	0	0	0	0	0	0	21
22	1960–1969	98,400	98,200	0	0	0	200	0	0	0	22
23	1950–1959	94,000	93,600	0	0	0	200	0	300	0	23
24	1940–1949	31,000	31,000	0	0	0	0	0	0	0	24
25	1930–1939	41,500	40,800	0	0	0	0	0	0	700	25
26	1920–1929	22,900	22,900	0	0	0	0	0	0	0	26
27	1919 or earlier	28,800	28,800	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 2002	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 2002 stock	2011 units added in other ways	Row
	Rooms										
28	1	500	0	300	0	0	200	0	0	0	28
29	2	1,800	1,500	300	0	0	0	0	0	0	29
30	3	52,000	36,200	10,200	0	0	0	5,300	0	200	30
31	4	142,500	91,000	36,500	0	0	300	14,700	0	0	31
32	5	157,100	74,800	67,400	0	0	200	14,200	300	200	32
33	6	121,100	55,500	55,500	0	0	0	9,900	0	300	33
34	7	89,500	30,000	49,400	0	0	0	10,100	0	0	34
35	8	59,000	16,900	32,500	0	0	0	9,600	0	0	35
36	9	31,900	7,900	19,000	0	0	0	5,000	0	0	36
37	10 or more	18,800	6,200	7,000	0	0	0	5,500	0	0	37
	Bedrooms										
38	None	1,800	1,000	600	0	0	200	0	0	0	38
39	1	67,300	53,400	5,700	0	0	0	7,900	0	200	39
40	2	214,500	172,600	21,100	0	0	400	20,000	0	200	40
41	3	275,600	221,900	27,700	0	0	0	25,500	300	300	41
42	4 or more	115,100	77,500	16,600	0	0	0	21,000	0	0	42
43	Multiunit structures	271,000	242,300	0	0	0	500	28,000	300	0	43
	Stories in structure										
44	1	8,300	7,000	0	0	0	0	1,200	0	0	44
45	2	119,300	111,900	0	0	0	0	7,400	0	0	45
46	3	120,900	109,600	0	0	0	300	10,800	300	0	46
47	4 to 6	19,500	13,500	0	0	0	200	5,800	0	0	47
48	7 or more	3,000	300	0	0	0	0	2,700	0	0	48

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

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
1	Occupied units	627,900	526,500	32,700	0	0	600	67,800	0		1
2	With complete kitchen	603,000	489,500	47,400	0	0	400	65,500	0		2
3	Lacking complete kitchen facilities	24,900	1,800	20,500	0	0	200	2,300	0		3
4	With complete plumbing	620,000	515,000	36,600	0	0	600	67,500	0		4
5	Lack some plumbing	7,900	500	7,000	0	0	0	300	0		5
6	No hot piped water	0	0	0	0	0	0	0	0		6
7	No bathtub/shower										7
8	No flush toilet										8
9	No exclusive use	7,900	500	7,000	0	0	0	300	0		9
	Water										
10	Public/private water	517,000	425,600	36,000	0	0	600	54,600	0		10
11	Well serving 1 to 5 units	110,900	95,300	2,300	0	0	0	13,300	0		11
12	Other water source										12
	Sewer										
13	Public sewer	553,400	459,100	36,400	0	0	600	57,000	0		13
14	Septic tank/cesspool	74,500	60,500	3,300	0	0	0	10,800	0		14
15	Other										15

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
16	Severe problems	9,800	500	9,000	0	0	0	300	0		16
17	Plumbing	7,900	500	7,000	0	0	0	300	0		17
18	Heating	1,900	0	1,900	0	0	0	0	0		18
19	Electric										19
20	Upkeep										20
21	Moderate problems	28,700	2,300	23,800	0	0	200	2,300	0		21
22	Plumbing										22
23	Heating										23
24	Kitchen	24,900	1,800	20,500	0	0	200	2,300	0		24
25	Upkeep	4,400	0	4,400	0	0	0	0	0		25



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

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
1	Occupied units	627,900	526,500	32,700	0	0	600	67,800	0	300	1
	Age of householder										
2	Under 65	479,700	350,100	73,900	0	0	600	54,800	0	300	2
3	65 to 74	74,300	8,100	60,300	0	0	0	5,900	0	0	3
4	75 or older	74,000	28,200	38,500	0	0	0	7,200	0	0	4
	Children in household										
5	Some	198,000	90,100	78,200	0	0	300	29,300	0	300	5
6	None	429,900	291,600	99,300	0	0	400	38,600	0	0	6
	Race and ethnicity										
7	White	547,600	448,800	38,100	0	0	600	60,100	0	0	7
8	Hispanic	23,200	4,000	15,900	0	0	500	2,800	0	0	8
9	Non-Hispanic	524,300	429,100	37,800	0	0	200	57,200	0	0	9
10	Black	58,900	22,700	31,100	0	0	0	4,800	0	300	10
11	Hispanic	400	0	400	0	0	0	0	0	0	11
12	Non-Hispanic	58,600	22,300	31,100	0	0	0	4,800	0	300	12
13	American Indian or Alaska Native alone	2,100	300	1,800	0	0	0	0	0	0	13
14	Asian or Pacific Islander	13,600	2,500	9,100	0	0	0	2,000	0	0	14
16	Other	5,700	4,800	0	0	0	0	900	0	0	16
17	Hispanic or Latino (any race)	24,500	6,300	14,900	0	0	500	2,800	0	0	17

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
	Income sources of families and primary individuals										
18	Wages and salaries	460,700	342,900	65,800	0	0	400	51,400	0	300	18
20	Dividends, interest, or rent	183,200	107,800	54,400	0	0	0	21,100	0	0	20
21	Public assistance or public welfare	8,300	1,300	6,200	0	0	0	700	0	0	21

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

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
1	Occupied units	627,900	526,500	32,700	0	0	600	67,800	0	300	1
	Tenure										
2	Owner-occupied	405,200	336,000	18,300	0	0	0	50,900	0	0	2
3	Homeownership rate	64.5%									3
4	Renter-occupied	222,700	162,100	42,800	0	0	600	16,900	0	300	4
	Renter monthly housing costs										
5	No cash rent	4,100	800	3,200	0	0	0	0	0	0	5
6	Less than \$350	12,600	4,300	7,100	0	0	0	1,200	0	0	6
7	\$350 to \$599	24,700	10,000	13,100	0	0	0	1,500	0	0	7
8	\$600 to \$799	68,500	29,600	36,800	0	0	200	1,700	0	300	8
9	\$800 to \$1,249	89,100	25,800	54,400	0	0	300	8,700	0	0	9
10	\$1,250 or more	23,700	3,900	15,800	0	0	200	3,800	0	0	10
	Renter household income										
11	Less than \$15,000	47,600	12,700	31,200	0	0	200	3,400	0	0	11
12	\$15,000 to \$29,999	59,000	12,300	40,900	0	0	0	5,500	0	300	12
13	\$30,000 to \$49,999	44,600	11,200	31,000	0	0	300	2,200	0	0	13
14	\$50,000 to \$99,999	63,300	16,000	41,600	0	0	200	5,500	0	0	14
15	\$100,000 or more	8,300	900	7,100	0	0	0	300	0	0	15

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2002	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 2002 stock	2011 units added in other ways	Row
	Owner monthly housing costs										
16	Less than \$350	6,700	1,400	5,100	0	0	0	300	0	0	16
17	\$350 to \$599	56,800	28,100	25,600	0	0	0	3,100	0	0	17
18	\$600 to \$799	56,400	8,500	43,300	0	0	0	4,500	0	0	18
19	\$800 to \$1,249	80,300	28,800	45,000	0	0	0	6,600	0	0	19
20	\$1,250 or more	205,000	87,200	81,400	0	0	0	36,400	0	0	20
	Owner household income										
21	Less than \$15,000	24,400	3,500	19,600	0	0	0	1,200	0	0	21
22	\$15,000 to \$29,999	49,800	10,700	34,700	0	0	0	4,400	0	0	22
23	\$30,000 to \$49,999	67,400	14,600	48,300	0	0	0	4,500	0	0	23
24	\$50,000 to \$99,999	134,000	59,800	61,100	0	0	0	13,100	0	0	24
25	\$100,000 or more	129,600	44,800	57,200	0	0	0	27,600	0	0	25

**Forward-Looking Rental Dynamics Table 1: Counts, 2002–2011, Milwaukee**

Affordability categories	A Total in 2002	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	33,900	15,200	1,300	8,500	4,400	900	400	400	0	1,700	400	800
Extremely low rent	21,400	1,000	1,900	9,800	3,100	1,900	400	0	0	1,900	800	500
Very low rent	136,300	5,100	1,500	62,200	41,200	13,500	400	0	1,200	6,900	3,000	1,300
Low rent	30,400	1,000	400	3,000	3,600	17,200	900	0	300	3,200	600	200
Moderate rent	9,900	200	0	400	200	3,800	1,800	0	1,500	1,000	700	200
High rent	3,700	0	0	0	0	300	1,000	1,000	700	300	300	0
Very high rent	1,500	0	0	0	0	0	0	0	1,000	0	300	200
Extremely high rent	300	0	0	0	0	0	0	300	0	0	0	0
Total	237,400	22,500	5,100	83,900	52,500	37,600	4,900	1,700	4,700	15,000	6,100	3,200

**Forward-Looking Rental Dynamics Table 2: Row Percentages, 2002–2011, Milwaukee**

Affordability categories	A Total in 2002	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	33,900	44.8%	3.7%	24.9%	13.0%	2.8%	1.1%	1.1%	0.0%	5.0%	1.3%	2.3%
Extremely low rent	21,400	4.7%	9.0%	45.6%	14.5%	9.0%	2.0%	0.0%	0.0%	9.0%	3.8%	2.5%
Very low rent	136,300	3.8%	1.1%	45.7%	30.2%	9.9%	0.3%	0.0%	0.8%	5.1%	2.2%	0.9%
Low rent	30,400	3.4%	1.2%	10.0%	11.8%	56.4%	3.0%	0.0%	1.1%	10.4%	2.0%	0.6%
Moderate rent	9,900	2.3%	0.0%	3.7%	2.3%	38.4%	18.3%	0.0%	15.2%	10.3%	7.3%	2.3%
High rent	3,700	0.0%	0.0%	0.0%	0.0%	8.2%	27.7%	28.2%	19.5%	8.2%	8.2%	0.0%
Very high rent	1,500	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	69.0%	0.0%	19.2%	11.8%
Extremely high rent	300	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
Total	237,400	9.5%	2.1%	35.3%	22.1%	15.8%	2.1%	0.7%	2.0%	6.3%	2.6%	1.3%

**Backward-Looking Rental Dynamics Table 1: Counts, 2002–2011, Milwaukee**

Affordability categories	A Total in 2011	B Non- market in 2002	C Extremely low rent in 2002	D Very low rent in 2002	E Low rent in 2002	F Moderate rent in 2002	G High rent in 2002	H Very high rent in 2002	I Extremely high rent in 2002	J Owner- occupied in 2002	K Seasonal or related vacant in 2002	L New construction	M Added in other ways
Non-market	29,700	14,200	700	4,500	1,000	300	0	0	0	3,500	400	4,900	200
Extremely low rent	6,300	1,000	1,800	1,800	300	0	0	0	0	1,100	0	300	0
Very low rent	81,500	7,700	8,200	55,700	2,400	300	0	0	0	4,300	1,900	600	400
Low rent	57,900	4,100	2,700	37,500	3,100	200	0	0	0	5,000	2,100	2,700	500
Moderate rent	44,700	900	1,700	12,600	15,400	3,500	300	0	0	4,000	700	5,600	0
High rent	9,000	300	400	400	900	1,600	1,000	0	0	1,900	0	2,500	0
Very high rent	5,100	300	0	0	0	0	1,000	0	300	700	0	2,700	0
Extremely high rent	6,000	0	0	1,000	400	1,400	700	1,000	0	800	0	700	0
Total	240,200	28,500	15,500	113,500	23,600	7,300	3,000	1,000	300	21,400	5,000	19,900	1,100

**Backward-Looking Rental Dynamics Table 2: Row Percentages, 2002–2011, Milwaukee**

Affordability categories	A Total in 2011	B Non- market in 2002	C Extremely low rent in 2002	D Very low rent in 2002	E Low rent in 2002	F Moderate rent in 2002	G High rent in 2002	H Very high rent in 2002	I Extremely high rent in 2002	J Owner- occupied in 2002	K Seasonal or related vacant in 2002	L New construction	M Added in other ways
Non-market	29,700	47.8%	2.5%	15.3%	3.4%	0.9%	0.0%	0.0%	0.0%	11.8%	1.2%	16.5%	0.7%
Extremely low rent	6,300	16.5%	27.8%	28.0%	5.3%	0.0%	0.0%	0.0%	0.0%	17.0%	0.0%	5.3%	0.0%
Very low rent	81,500	9.4%	10.0%	68.3%	3.0%	0.4%	0.0%	0.0%	0.0%	5.3%	2.3%	0.7%	0.5%
Low rent	57,900	7.1%	4.7%	64.8%	5.4%	0.4%	0.0%	0.0%	0.0%	8.6%	3.6%	4.6%	0.9%
Moderate rent	44,700	1.9%	3.9%	28.2%	34.3%	7.8%	0.7%	0.0%	0.0%	9.0%	1.5%	12.5%	0.0%
High rent	9,000	3.7%	4.0%	4.0%	9.6%	17.8%	11.2%	0.0%	0.0%	21.8%	0.0%	28.0%	0.0%
Very high rent	5,100	6.6%	0.0%	0.0%	0.0%	0.0%	19.5%	0.0%	6.6%	14.3%	0.0%	53.1%	0.0%
Extremely high rent	6,000	0.0%	0.0%	16.9%	7.4%	23.6%	11.1%	16.6%	0.0%	13.3%	0.0%	11.2%	0.0%
Total	240,200	11.9%	6.4%	47.3%	9.8%	3.1%	1.2%	0.4%	0.1%	8.9%	2.1%	8.3%	0.5%