

American Housing Survey

**Components of Inventory Change and
Rental Dynamics Analysis:
Pittsburgh, 2004–2011**

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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 Pittsburgh metropolitan area changed between 2004 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 Pittsburgh and on their occupants in both 2004 and 2011.

In 2004 the Pittsburgh metropolitan area contained 1,069,200 housing units, including vacant units. By 2011 the number of housing units had increased to 1,104,900. Part of this increase was due to a redefinition of the metropolitan area that added Armstrong County. We estimate that the 2011 count of housing units for the metropolitan area as defined in 2004 would be 1,072,600. This represents an overall increase of only 0.3 percent over the 7-year period.

Between 2004 and 2011, 15,700 units left the housing stock. Of these, 8,000 are clearly permanent losses—the original unit is gone, and major construction would be required to replace it with a new unit. Another 5,400 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 2,300 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 7,000 of the permanent losses, while mergers and conversions contributed another 1,000 permanent losses.

In the period between the 2004 and the 2011 AHS surveys, 57,500 units were added to the housing stock. Eighty-six percent of these additions were newly constructed units. The 2011 AHS did track move-ins of mobile homes in Pittsburgh, a factor that added 6,000 new units. Also, 1,700 units were formed from the conversion or merger of 2004 units. We classified 4,000 units as recovered: 2,600 had been in the housing stock at some point but were classified in 2004 as nonresidential, and another 1,400 were uninhabitable in 2004. Finally, 1,500 units were added in other unclassified ways.

The Pittsburgh metropolitan area lost 1.5 percent of all 2004 housing units by 2011, and new additions represented 7.0 percent of the 2011 housing stock. Several sectors had significantly higher or significantly lower rates of loss or addition.

- Units occupied in 2004 had a loss rate that was statistically different than and less than half of the overall loss rate. The loss rate among units that were vacant in 2004 was very high.

- The loss rate was surprisingly low among units built in the 1950s and 1960s but very high among units built before 1930.
- Smaller units (3 rooms or 1 bedroom) experienced high loss rates, whereas larger units (6 or 7 rooms or 3 bedrooms) had lower rates.
- The loss rates for owner-occupied units and renter-occupied units were virtually identical. The only statistically different rate among these sectors applied to units owned in 2004 by households earning \$100,000 or more; the loss rate for this group was lower than the rate for all occupied units.
- Growth varied by structure type and unit size. Single-family attached units had a higher-than-average rate of addition, while multifamily units—particularly those in 2-story or 4- to 6-story buildings—had low rates of addition. Small units, whether measured by number of rooms or number of bedrooms, had low rates of addition, whereas large units had high rates.
- The rates of addition were below average among units that require wells or septic tanks.
- The rate of addition was low among units that were renter-occupied in 2011 and, among rental units, particularly low for those occupied by households earning less than \$50,000 and those with low monthly housing costs (less than \$800). Additions were higher than normal among high-cost rentals (\$1,250 or more).
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units but not statistically different. However, there were clear patterns among owner-occupied units by household income and housing costs. Those occupied in 2011 by lower income owners (less than \$30,000) and those with low monthly housing costs (\$350–\$599) had lower rates of addition. Units occupied by high-income owners (\$100,000 or more) and those with high monthly housing costs (\$1,250 or more) had higher-than-average rates of addition.

The 2004 rental stock in Pittsburgh was affordable. Of the 298,400 rental units in 2004, 158,800 were extremely low rent or very low rent units. In addition, 75,600 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 78.6 percent of the 2004 rental stock. The three highest rent categories comprised less than 2 percent of the rental stock. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—32.9 percent of all 2004 units compared to 9.5 percent. By 2011, 16.7 percent of the rental units in 2004 were no longer in the rental stock. The largest proportion of these losses was due to changes in tenure.

The rental stock in Pittsburgh was somewhat less affordable in 2011 than in 2004. Of the 324,900 rental units in 2011, 131,000 were extremely low rent or very low rent units. In addition, 75,000 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 63.4 percent of the 2011 rental stock. The three highest rent categories comprised 5.1 percent of the rental stock. Moves from a more affordable category in

2004 (sometimes called gentrification) exceeded moves from a less affordable category (sometimes called filtration)—28.9 percent of all 2011 units compared to 8.6 percent. Of the rental units in 2011, 25.8 percent were not rental in 2004. The largest proportion of these gains was due to changes in tenure.

Components of Inventory Change and Rental Dynamics Analysis: Pittsburgh, 2004–2011

1. Introduction

This report describes how the housing stock in the Pittsburgh metropolitan area changed between 2004 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 Pittsburgh and on their occupants in both 2004 and 2011.¹

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.²

CINCH reports present both forward-looking analysis (what happened to the 2004 units by 2011) and backward-looking analysis (where the 2011 units came from in terms of 2004).³ 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 Pittsburgh.
- Section 3 explains the changes in the housing stock between 2004 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 2004 and 2011.

¹ 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.

² 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>.

³ 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 Pittsburgh metropolitan area between 2004 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 2004–2011 period began during 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: Pittsburgh

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 2004 the Pittsburgh metropolitan area contained 1,069,200 housing units, including vacant units. By 2011 the number of housing units had increased to 1,104,900. Part of this increase was due to a redefinition of the metropolitan area that added Armstrong County. 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 2004 would be 1,072,600. This represents an overall increase of only 0.3 percent over the 7-year period.

The change in the geographical definition of Pittsburgh 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 Pittsburgh metropolitan area as defined in both 2004 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 2004 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 2,151 sample units that were

common to the 2004 and 2011 AHS Pittsburgh surveys and satisfied all the analytical requirements.⁴ Between 2004 and 2011, 58 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 2,209 sample units. Between 2004 and 2011, 110 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 2,261 sample units. In the forward-looking analysis, the average weight of a sample unit is approximately 484 units; in the backward-looking analysis, the average weight of a sample unit is approximately 489 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 Pittsburgh, 7 years separate the 2011 sample from the 2004 sample. As a result, explaining the loss or addition of sample units is 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: 2004–2011

Losses between 2004 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.

⁴ The 2004 AHS surveyed 4,723 units in the Pittsburgh metropolitan area; 2,729 of these units were in the 2011 AHS public use file (PUF). Of the 1,994 sample units no longer in the survey, 206 were legitimate temporary or permanent losses to the housing stock and were considered for the analysis. The remaining 1,788 cases are coded as “sample reduction for the current survey year” with no further explanation.

Table 1 reports that between 2004 and 2011, 15,700 units left the housing stock.⁵ Of these, 8,000 are clearly permanent losses—the original unit is gone, and major construction would be required to replace it with a new unit. Another 5,400 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 2,300 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 2004 Pittsburgh Housing Units in 2011⁶

Present in 2004	1,069,200
2004 units present in 2011	1,053,500
Units no longer in the stock	15,700
2004 units lost due to conversion/merger	1,000
2004 house or mobile home moved out	0
2004 units lost through demolition or disaster	7,000
Permanent losses	8,000
2004 units changed to nonresidential use	1,800
2004 units badly damaged or condemned	3,500
Temporary losses	5,400
2004 units lost in other ways	2,300

Demolitions and natural disasters accounted for 7,000 of the permanent losses, while mergers and conversions contributed another 1,000 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 Pittsburgh 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 2004.

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 2004. For each subgroup, these tables detail how many of the 2004 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 2004–2011 period.

⁵ With the caveats noted in Appendix A, this analysis applies to the area common to both the 2004 and 2011 definitions of the metropolitan area.

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

Additions between 2004 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 2004 and 2011.⁷

Table 2: Sources for 2011 Pittsburgh Housing Stock⁸

2011 housing stock	1,104,900
2011 units present in 2004	1,047,400
Total additions to stock	57,500
Units added by new construction	49,700
House or mobile home moved in	600
Units added by conversion/merger	1,700
New or reconstructed units	52,000
Units added from nonresidential use	2,600
Units added from temporary losses	1,400
Recovered units	4,000
Units added in other ways	1,500

In the period between the 2004 and the 2011 AHS surveys, 57,500 units were added to the housing stock. Eighty-six percent of these additions were newly constructed units. The 2011 AHS did track move-ins of mobile homes in Pittsburgh, a factor that added 6,000 new units. Also, 1,700 units were formed from the conversion or merger of 2004 units.

We classified 4,000 units as recovered: 2,600 had been in the housing stock at some point but were classified in 2004 as nonresidential, and another 1,400 were uninhabitable in 2004. Finally, 1,500 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 2004–2011 period.

4. Components With Atypical Losses or Additions

The Pittsburgh metropolitan area lost 1.5 percent of all 2004 housing units by 2011, but the loss rate varied across sectors of the stock. For example, the occupied housing stock lost 0.6 percent of its units between 2004 and 2011.

⁷ With the caveats noted in Appendix A, this analysis applies to the area common to both the 2004 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.

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

We examined all of the components of the 2004 Pittsburgh 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 Pittsburgh, 2004–2011⁹

Characteristics	Present in 2004	Total lost	Percent lost
<i>Housing stock</i>	1,069,200	15,700	1.5%
<i>Occupancy status</i>			
Occupied	953,900	5,300	0.6%***
Vacant	111,800	10,200	9.1%***
<i>Year built</i>			
1960–1969	118,600	600	0.5%**
1950–1959	167,200	700	0.4%**
1920–1929	96,900	4,100	4.2%*
1919 or earlier	131,200	4,500	3.4%*
<i>Rooms</i>			
3	81,900	3,800	4.6%*
6	227,900	1,500	0.7%*
7	170,300	900	0.5%**
<i>Bedrooms</i>			
1	121,000	4,600	3.8%*
3	454,200	2,500	0.6%***
<i>Tenure</i>			
Owner-occupied	705,800	3,500	0.5%
Renter-occupied	248,100	1,800	0.7%
<i>Owner household income</i>			
\$100,000 or more	122,700	400	0.3%***

*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.

Several sectors had significantly higher or significantly lower loss rates.

⁹ 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.

- Units occupied in 2004 had a loss rate that was statistically different than and less than half of the overall loss rate. The loss rate among units that were vacant in 2004 was very high.
- The loss rate was surprisingly low among units built in the 1950s and 1960s but very high among units built before 1930.
- Smaller units (3 rooms or 1 bedroom) experienced high loss rates, whereas larger units (6 or 7 rooms or 3 bedrooms) had lower rates.
- The loss rates for owner-occupied units and renter-occupied units were virtually identical. The only statistically different rate among these sectors applied to units owned in 2004 by households earning \$100,000 or more; the loss rate for this group was lower than the rate for all occupied units.

The 57,500 additions reported in Table 2 represent 7.0 percent of the 2011 housing stock. The rate of addition varied by the characteristics of the housing. Additions represented 5.2 percent of occupied units.

We examined all of the components of the 2004 Pittsburgh 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 Pittsburgh, 2004–2011¹⁰

Characteristics	Present in 2011	Total additions	Percent additions
<i>Housing stock</i>	1,104,900	57,500	5.2%
<i>Occupancy status</i>			
Occupied	992,700	51,500	5.2%
Vacant	103,800	5,100	4.9%
<i>Units in structure</i>			
1, attached	84,000	14,500	17.3%***
<i>Rooms</i>			

¹⁰ 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
3	87,500	1,600	1.8% ****
4	178,400	5,700	3.2%
8	106,800	9,400	8.8% *
9	47,300	5,200	11.0% *
10 or more	31,100	4,800	15.4% **
<i>Bedrooms</i>			
1	108,800	1,600	1.5% ***
2	300,000	10,900	3.6% *
4 or more	207,700	22,600	10.9% ****
<i>Multifamily units</i>	210,200	5,900	2.8% **
<i>Stories in structure</i>			
2	53,200	600	1.2% ***
4 to 6	32,400	600	1.8% *
<i>Water</i>			
Well serving 1 to 5 units	94,100	1,700	1.8% ***
<i>Sewer</i>			
Septic tank/cesspool	157,100	5,000	3.2% *
<i>Age of householder</i>			
65 to 74	118,000	2,200	1.8% ***
<i>Tenure</i>			
Owner-occupied	701,500	42,600	6.1%
Renter-occupied	291,200	8,900	3.1% **
<i>Renter monthly housing costs</i>			
\$350 to \$599	70,000	1,700	2.5% *
\$600 to \$799	86,800	600	0.7% ****
\$1,250 or more	12,400	2,400	19.2% *
<i>Renter household income</i>			
Less than \$15,000	90,000	1,900	2.1% **
\$30,000 to \$49,999	64,700	600	1.0% ****
<i>Owner monthly housing costs</i>			
\$350 to \$599	174,300	900	0.5% ****
\$1,250 or more	221,300	29,800	13.5% ****
<i>Owner household income</i>			
Less than \$15,000	62,900	1,100	1.7% ****
\$15,000 to \$29,999	109,800	2,800	2.5% **
\$100,000 or more	165,200	18,700	11.3% ****

*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.

Table 4 identifies a number of characteristics for which the rates of addition was statistically different than the benchmark rates, and some clear patterns emerge.

- Growth varied by structure type and unit size. Single-family attached units had a higher-than-average rate of addition, while multifamily units—particularly those in 2-story or 4- to 6-story buildings—had low rates of addition. Small units, whether measured by number of rooms or number of bedrooms, had low rates of addition, whereas large units had high rates.

- The rates of addition were below average among units that require wells or septic tanks.
- The rate of addition was low among units that were renter-occupied in 2011 and, among rental units, particularly low for those occupied by households earning less than \$50,000 and those with low monthly housing costs (less than \$800). Additions were higher than normal among high-cost rentals (\$1,250 or more).
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units but not statistically different. However, there were clear patterns among owner-occupied units by household income and housing costs. Those occupied in 2011 by lower income owners (less than \$30,000) and those with low monthly housing costs (\$350–\$599) had lower rates of addition. Units occupied by high-income owners (\$100,000 or more) and those with high monthly housing costs (\$1,250 or more) had higher-than-average rates of addition.

5. Rental Market Dynamics: 2004–2011

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.¹¹ 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 2004 rental units by how affordable they were in 2004. 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 Pittsburgh

Affordability categories	2004 rental units	To more affordable categories in 2011	In same affordability category in both years	To less affordable categories in 2011	2004 rental units non-rental in 2011
Non-market	75,600	NA	58.9%	26.4%	14.6%
Extremely low rent	42,100	7.0%	16.8%	56.9%	19.3%
Very low rent	116,700	6.9%	46.5%	29.1%	17.4%
Low rent	37,800	17.3%	25.6%	43.6%	13.5%
Moderate rent	21,300	37.7%	24.4%	17.6%	20.2%
High rent	1,600	71.0%	29.0%	0.0%	0.0%
Very high rent	2,700	61.3%	0.0%	0.0%	38.7%
Extremely high rent	600	0.0%	100.0%	NA	0.0%
Total	298,400	9.5%	40.8%	32.9%	16.7%

The 2004 rental stock in Pittsburgh was affordable. Of the 298,400 rental units in 2004, 158,800 were extremely low rent or very low rent units. In addition, 75,600 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 78.6 percent of the 2004 rental stock. The three highest rent categories comprised less than 2 percent of the rental stock. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—32.9 percent of all 2004 units compared to 9.5 percent.

By 2011, 16.7 percent of the 298,400 rental units in 2004 were no longer in the rental stock (49,800 units). The largest proportion of these losses was due to changes in tenure, with 30,200 rental units becoming owner-occupied or vacant for sale in 2011. Another 13,300 units became seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally 6,500 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 2004, 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.

¹¹ Gross rent is equal to rent plus utilities.

The rental stock in Pittsburgh was somewhat less affordable in 2011 than in 2004. Of the 324,900 rental units in 2011, 131,000 were extremely low rent or very low rent units. In addition, 75,000 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 63.4 percent of the 2011 rental stock. The three highest rent categories comprised 5.1 percent of the rental stock. Moves from a more affordable category (sometimes called gentrification) exceeded moves from a less affordable category (sometimes called filtration)—28.9 percent of all 2011 units compared to 8.6 percent.

Table 6: Summary of Backward-Looking Rental Dynamics for Pittsburgh

Affordability categories	2011 rental units	From more affordable categories in 2004	In same affordability category in both years	From less affordable categories in 2004	2011 rental units non-rental in 2004
Non-market	75,000	NA	57.4%	16.4%	26.2%
Extremely low rent	15,700	7.1%	43.7%	25.1%	24.1%
Very low rent	115,300	25.4%	46.6%	4.9%	23.1%
Low rent	54,600	51.3%	17.3%	7.8%	23.5%
Moderate rent	47,700	56.7%	11.0%	2.4%	29.9%
High rent	12,100	64.8%	4.5%	4.6%	26.1%
Very high rent	2,300	20.5%	0.0%	0.0%	79.5%
Extremely high rent	2,100	0.0%	27.9%	NA	72.1%
Total	324,900	28.9%	36.8%	8.6%	25.8%

Of the 324,900 rental units in 2011, 25.8 percent were not rental in 2004 (83,700 units). The largest proportion of these gains was due to changes in tenure, with 59,400 rental units having been owner-occupied or vacant for sale in 2004. Another 14,900 units had been seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally, 9,300 rental units had not been in the housing stock in 2004, 5,000 were newly constructed, and 4,300 were added by means other than new construction. 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: Pittsburgh Metropolitan Area, 2004–2011

In 2004 the Pittsburgh metropolitan area contained 1,069,200 housing units, including vacant units. By 2011 the number of housing units had increased to 1,104,900. Part of this increase was due to a redefinition of the metropolitan area that added Armstrong County. We estimate that the 2011 count of housing units for the metropolitan area as defined in 2004 would be 1,072,600. This represents an overall increase of only 0.3 percent over the 7-year period.

The change in the geographical definition of Pittsburgh 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 Pittsburgh metropolitan area as defined in both 2004 and 2011.

Between 2004 and 2011, 15,700 units left the housing stock. Of these, 8,000 are clearly permanent losses—the original unit is gone, and major construction would be required to replace it with a new unit. Another 5,400 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 2,300 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 7,000 of the permanent losses, while mergers and conversions contributed another 1,000 permanent losses. Unfortunately, the 2011 AHS survey in Pittsburgh did not track mobile home move-outs.

In the period between the 2004 and the 2011 AHS surveys, 57,500 units were added to the housing stock. Eighty-six percent of these additions were newly constructed units. The 2011 AHS did track move-ins of mobile homes in Pittsburgh, a factor that added 6,000 new units. Also, 1,700 units were formed from the conversion or merger of 2004 units. We classified 4,000 units as recovered: 2,600 had been in the housing stock at some point but were classified in 2004 as nonresidential, and another 1,400 were uninhabitable in 2004. Finally, 1,500 units were added in other unclassified ways.

The Pittsburgh metropolitan area lost 1.5 percent of all 2004 housing units by 2011; the occupied housing stock lost 0.6 percent of its units between 2004 and 2011. New additions represented 7.0 percent of the 2011 housing stock, and additions represented 5.2 percent of occupied units. Several sectors had significantly higher or significantly lower rates of loss or addition.

- Units occupied in 2004 had a loss rate that was statistically different than and less than half of the overall loss rate. The loss rate among units that were vacant in 2004 was very high.
- The loss rate was surprising low among units built in the 1950s and 1960s but very high among units built before 1930.
- Smaller units (3 rooms or 1 bedroom) experienced high loss rates, whereas larger units (6 or 7 rooms or 3 bedrooms) had lower rates.
- The loss rates for owner-occupied units and renter-occupied units were virtually identical. The only statistically different rate among these sectors applied to units owned in 2004 by households earning \$100,000 or more; the loss rate for this group was lower than the rate for all occupied units.
- Growth varied by structure type and unit size. Single-family attached units had a higher-than-average rate of addition, while multifamily units—particularly those in 2-story or 4- to 6-story buildings—had low rates of addition. Small units, whether measured by number of rooms or number of bedrooms, had low rates of addition, whereas large units had high rates.
- The rates of addition were below average among units that require wells or septic tanks.

- The rate of addition was low among units that were renter-occupied in 2011 and, among rental units, particularly low for those occupied by households earning less than \$50,000 and those with low monthly housing costs (less than \$800). Additions were higher than normal among high-cost rentals (\$1,250 or more).
- The rate of addition among units that were owner-occupied in 2011 was higher than that of all occupied units but not statistically different. However, there were clear patterns among owner-occupied units by household income and housing costs. Those occupied in 2011 by lower income owners (less than \$30,000) and those with low monthly housing costs (\$350–\$599) had lower rates of addition. Those occupied by high-income owners (\$100,000 or more) and those with high monthly housing costs (\$1,250 or more) had higher-than-average rates of addition.

The 2004 rental stock in Pittsburgh was affordable. Of the 298,400 rental units in 2004, 158,800 were extremely low rent or very low rent units. In addition, 75,600 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 78.6 percent of the 2004 rental stock. The three highest rent categories comprised less than 2 percent of the rental stock. Moves to a less affordable category (sometimes called gentrification) exceeded moves to a more affordable category (sometimes called filtration)—32.9 percent of all 2004 units compared to 9.5 percent.

By 2011, 16.7 percent of the 298,400 rental units in 2004 were no longer in the rental stock (49,800 units). The largest proportion of these losses was due to changes in tenure, with 30,200 rental units becoming owner-occupied or vacant for sale in 2011. Another 13,300 units became seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally 6,500 rental units were no longer in the housing stock in 2011.

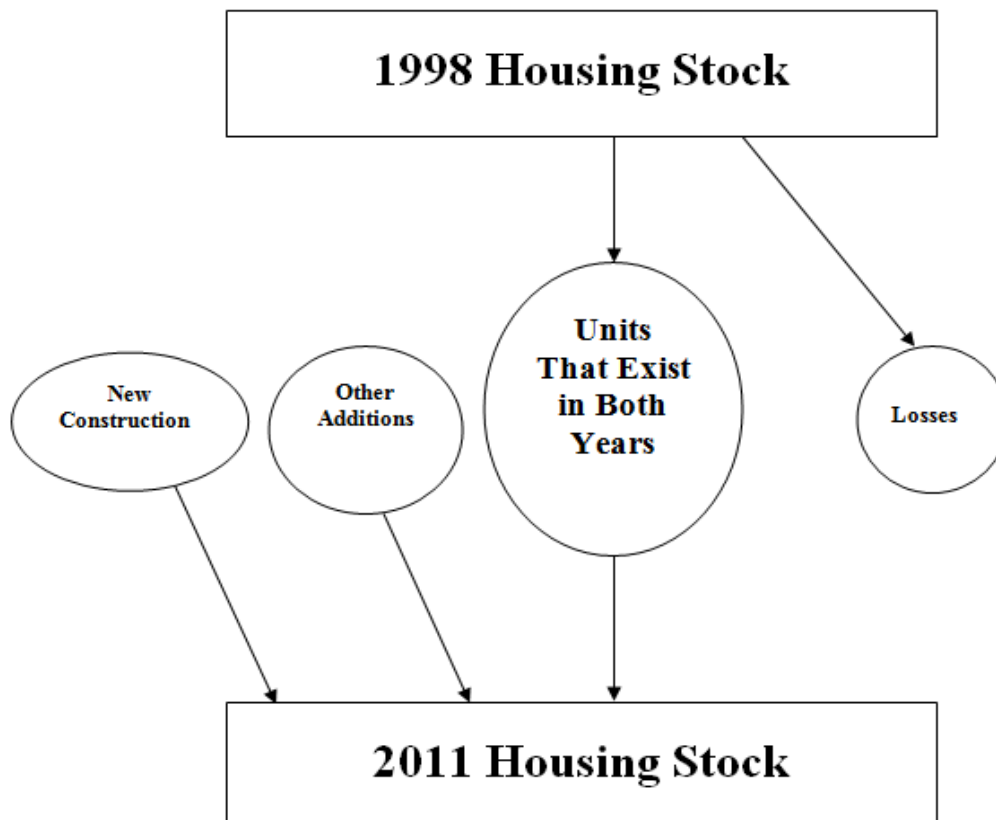
The rental stock in Pittsburgh was somewhat less affordable in 2011 than in 2004. Of the 324,900 rental units in 2011, 131,000 were extremely low rent or very low rent units. In addition, 75,000 units were non-market; that is, they were either assisted or offered for no cash rent. These three categories accounted for 63.4 percent of the 2011 rental stock. The three highest rent categories comprised 5.1 percent of the rental stock. Moves from a more affordable category in 2004 (sometimes called gentrification) exceeded moves from a less affordable category (sometimes called filtration)—28.9 percent of all 2011 units compared to 8.6 percent. Of the 324,900 rental units in 2011, 25.8 percent were not rental in 2004 (83,700 units). The largest proportion of these gains was due to changes in tenure, with 59,400 rental units having been owner-occupied or vacant for sale in 2004.

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 2004 and 2011 housing stocks) and one oval (units added through new construction between 2004 and 2011). No one estimates the other three ovals: the number of units that belong to both the 2004 and 2011 housing stock, units lost to the housing stock between 2004 and 2011, and other additions to the housing stock between 2004 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:¹²

- 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.

¹² 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, 2004, 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 2004 and 2011. In some cases, there may be no status, (e.g., not yet constructed in 2004) 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 2004 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.¹³ For example, the exact accounting might show that 2,500 sample units that were rental in 2004 became owner-occupied or vacant for sale in 2011. To estimate the number of units in the national housing stock that were rental in 2004 and became owner-occupied in 2011, one would need to apply weights. However, using 2004 weights would produce a different estimate than using 2011 weights. There is no conceptual reason to favor the answer using 2004 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 (2004) 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 (2004). 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.

¹³ 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 2004 and 2011, and the application to the common area is not precise for the following reasons:

- For forward-looking analysis (2004 to 2011), we observe only those sample units in the geography common to both 2004 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 2004 geography. Since the common area is smaller than the 2004 geography, the counts are overestimates for the common area.
- For the backward-looking analysis (2011 from 2004), we observe (a) sample units that were in the common area in 2004 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 2004 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 2004 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 2004 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 2004.

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 2004 housing stock by 2011. There are three possible dispositions of 2004 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 2004. There are three possible sources of 2011 units:

- Units that existed in 2004 with the same characteristics (or serving the same market).

- Units that existed in 2004 but with different characteristics (or serving a different market).
- Units that are additions to the housing stock between 2004 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 (2004 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 2004 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.¹⁴

- 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.¹⁵
- 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 2004 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 2004.
- Column H is the CINCH estimate of the number of units from column B that were newly constructed between 2004 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

¹⁴ 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.

¹⁵ 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 2004.¹⁶
- 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 2004 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 2004 housing stock relate to the 2011 housing stock. Column A estimates the number of units in each affordability category in 2004. Columns B through L explain where the 2004 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 2004 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.

¹⁶ 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 2004 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 2004, they will be counted in columns B through I, depending upon how affordable they are in 2004.
- 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 2004 are counted in column K.
- Column L counts rental units that were newly constructed between 2004 and 2011.
- Column M counts rental units that were added to the housing stock after 2004 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 7-year period; for example, a unit that is low rent in 2004 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 2004 and 2011.

Forward-Looking Table A: Housing Characteristics, Pittsburgh

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	Row
1	Housing stock	1,069,200	1,053,500	0	1,000	0	1,800	7,000	3,500	2,300	1
	Occupancy status										
2	Occupied	953,900	861,300	87,300	300	0	300	2,400	1,000	1,400	2
3	Vacant	111,800	28,200	73,500	700	0	1,500	4,500	2,500	900	3
4	Seasonal	3,500	600	2,700	0	0	0	200	0	0	4
	Units in structure										
5	1, detached	702,300	694,800	0	0	0	200	4,500	1,400	1,400	5
6	1, attached	87,400	85,700	0	0	0	600	600	200	300	6
7	2 to 4	99,100	95,300	0	600	0	600	1,300	1,300	0	7
8	5 to 9	42,100	40,100	0	0	0	0	600	600	700	8
9	10 to 19	26,200	25,900	0	300	0	0	0	0	0	9
10	20 to 49	20,800	20,800	0	0	0	0	0	0	0	10
11	50 or more	34,500	34,100	0	0	0	300	0	0	0	11
12	Manufactured/mobile home	56,800	56,800	0	0	0	0	0	0	0	12

Row	A Characteristics	B Present in 2004	C 2004 units present in 2011	D Change in characteristics	E 2004 units lost due to conversion/ merger	F 2004 house or mobile home moved out	G 2004 units changed to nonresidential use	H 2004 units lost through demolition or disaster	I 2004 units badly damaged or condemned	J 2004 units lost in other ways	Row
	Year built										
15	2000–2004	36,300	36,000	0	0	0	0	300	0	0	15
16	1995–1999	28,900	28,800	0	0	0	0	0	200	0	16
17	1990–1994	45,800	45,600	0	0	0	0	200	0	0	17
18	1985–1989	50,400	50,100	0	0	0	0	200	0	0	18
19	1980–1984	38,200	38,200	0	0	0	0	0	0	0	19
20	1975–1979	74,100	73,300	0	300	0	0	500	0	0	20
21	1970–1974	82,100	81,500	0	0	0	0	300	0	200	21
22	1960–1969	118,600	118,100	0	0	0	300	0	0	200	22
23	1950–1959	167,200	166,500	0	0	0	0	500	0	200	23
24	1940–1949	121,400	119,400	0	0	0	300	600	600	600	24
25	1930–1939	78,100	76,600	0	0	0	300	900	300	0	25
26	1920–1929	96,900	92,800	0	300	0	300	2,000	900	600	26
27	1919 or earlier	131,200	126,700	0	300	0	600	1,500	1,600	500	27
	Rooms										
28	1	9,600	6,800	1,900	0	0	0	600	0	300	28
29	2	9,700	2,500	6,300	300	0	300	0	0	200	29
30	3	81,900	60,800	17,400	300	0	600	1,100	1,300	300	30
31	4	194,300	126,900	63,300	0	0	600	2,000	1,100	500	31
32	5	208,300	125,000	81,400	300	0	300	1,100	200	0	32
33	6	227,900	121,100	105,200	0	0	0	1,300	200	0	33
34	7	170,300	80,700	88,800	0	0	0	200	200	500	34
35	8	93,400	42,000	50,800	0	0	0	400	0	200	35
36	9	33,000	12,500	20,300	0	0	0	0	0	200	36
37	10 or more	40,700	12,800	27,300	0	0	0	200	500	0	37

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/ merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	Row
	Bedrooms										
38	None	13,900	7,900	5,100	0	0	0	600	0	300	38
39	1	121,000	91,900	24,500	1,000	0	1,000	1,100	1,300	200	39
40	2	309,400	238,500	65,600	0	0	900	2,300	1,300	800	40
41	3	454,200	380,500	71,100	0	0	0	2,100	200	200	41
42	4 or more	170,700	135,800	32,600	0	0	0	900	700	700	42
43	Multiunit structures	222,700	216,200	0	1,000	0	1,000	1,900	2,000	700	43
	Stories in structure										
44	1	7,800	7,500	0	300	0	0	0	0	0	44
45	2	70,200	67,300	0	300	0	300	1,600	700	0	45
46	3	88,300	85,700	0	300	0	300	300	1,000	700	46
47	4 to 6	29,500	29,500	0	0	0	0	0	0	0	47
48	7 or more	26,900	26,200	0	0	0	300	0	300	0	48

Forward-Looking Table B: Unit Quality, Pittsburgh

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	Row
1	Occupied units	953,900	861,300	87,300	300	0	300	2,400	1,000	1,400	1
2	With complete kitchen	938,900	844,600	89,500	300	0	0	2,400	1,000	1,200	2
3	Lacking complete kitchen facilities	15,000	2,600	11,800	0	0	300	0	0	200	3
4	With complete plumbing	946,200	849,300	92,100	300	0	300	2,000	1,000	1,200	4
5	Lack some plumbing	7,700	1,100	6,100	0	0	0	300	0	200	5
6	No hot piped water	2,200	0	1,700	0	0	0	300	0	200	6
7	No bathtub/shower	200	0	0	0	0	0	0	0	200	7
8	No flush toilet	200	0	0	0	0	0	0	0	200	8
9	No exclusive use	5,500	600	4,900	0	0	0	0	0	0	9
	Water										
10	Public/private water	836,400	751,500	80,500	300	0	300	1,900	1,000	1,000	10
11	Well serving 1 to 5 units	102,700	87,100	14,900	0	0	0	400	0	200	11
12	Other water source	14,800	12,800	1,800	0	0	0	0	0	200	12
	Sewer										
13	Public sewer	768,200	683,800	80,500	300	0	300	1,900	1,000	400	13
14	Septic tank/cesspool	185,500	135,000	49,300	0	0	0	400	0	700	14
15	Other	200	0	0	0	0	0	0	0	200	15

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	Row
16	Severe problems	13,700	1,100	12,100	0	0	0	300	0	200	16
17	Plumbing	7,700	1,100	6,100	0	0	0	300	0	200	17
18	Heating	4,000	0	4,000	0	0	0	0	0	0	18
19	Electric	1,100	0	1,100	0	0	0	0	0	0	19
20	Upkeep	2,100	0	2,100	0	0	0	0	0	0	20
21	Moderate problems	28,900	1,500	26,800	0	0	300	0	0	300	21
22	Plumbing	1,700	0	1,700	0	0	0	0	0	0	22
23	Heating	1,800	400	1,300	0	0	0	0	0	0	23
24	Kitchen	15,000	2,600	11,800	0	0	300	0	0	200	24
25	Upkeep	13,800	500	12,800	0	0	0	300	0	300	25

Forward-Looking Table C: Occupant Characteristics, Pittsburgh

Row	A	B	C	D	E	F	G	H	I	J	Row
	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	
1	Occupied units	953,900	861,300	87,300	300	0	300	2,400	1,000	1,400	1
	Age of householder										
2	Under 65	684,000	535,400	145,000	300	0	300	1,800	800	500	2
3	65 to 74	116,500	25,300	90,300	0	0	0	500	0	400	3
4	75 or older	153,400	75,700	77,000	0	0	0	0	200	400	4
	Children in household										
5	Some	271,900	144,300	125,800	0	0	300	1,100	400	0	5
6	None	682,000	529,800	148,700	300	0	0	1,300	500	1,400	6
	Race and ethnicity										
7	White alone	886,800	788,400	94,500	300	0	0	1,700	500	1,400	7
8	Hispanic	10,200	5,300	4,900	0	0	0	0	0	0	8
9	Non-Hispanic	876,600	772,800	99,800	300	0	0	1,700	500	1,400	9
10	Black alone	50,400	28,900	20,300	0	0	300	600	200	0	10
11	Hispanic	1,700	1,100	600	0	0	0	0	0	0	11
12	Non-Hispanic	48,800	27,300	20,300	0	0	300	600	200	0	12
13	American Indian or Alaska Native alone	1,900	400	1,500	0	0	0	0	0	0	13
14	Asian alone	8,200	3,800	4,400	0	0	0	0	0	0	14
15	Pacific Islander alone	400	400	0	0	0	0	0	0	0	15
16	Two or more races	6,100	1,300	4,500	0	0	0	0	200	0	16
17	Hispanic or Latino (any race)	12,300	6,800	5,500	0	0	0	0	0	0	17

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	Row
	Income sources of families and primary individuals										
18	Wages and salaries	678,300	498,400	175,300	300	0	300	1,800	1,000	1,200	18
20	Dividends, interest, or rent	329,000	122,700	205,100	0	0	300	200	200	400	20
21	Public assistance or public welfare	27,100	5,500	21,200	0	0	0	300	0	0	21

Forward-Looking Table D: Income and Housing Cost, Pittsburgh

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	Row
1	Occupied units	953,900	861,300	87,300	300	0	300	2,400	1,000	1,400	1
	Tenure										
2	Owner-occupied	705,800	607,200	95,100	300	0	0	1,100	700	1,400	2
3	Homeownership rate	74.00%									3
4	Renter-occupied	248,100	189,100	57,100	0	0	300	1,200	300	0	4
	Renter monthly housing costs										
5	No cash rent	14,000	3,200	10,800	0	0	0	0	0	0	5
6	Less than \$350	54,700	19,800	34,600	0	0	0	300	0	0	6
7	\$350 to \$599	89,700	26,700	62,100	0	0	300	600	0	0	7
8	\$600 to \$799	59,300	21,300	37,400	0	0	0	300	300	0	8
9	\$800 to \$1,249	27,100	10,900	16,200	0	0	0	0	0	0	9
10	\$1,250 or more	3,300	1,200	2,100	0	0	0	0	0	0	10
	Renter household income										
11	Less than \$15,000	91,000	37,800	52,600	0	0	0	600	0	0	11
12	\$15,000 to \$29,999	68,100	15,200	51,900	0	0	300	600	0	0	12
13	\$30,000 to \$49,999	54,500	11,800	42,300	0	0	0	0	300	0	13
14	\$50,000 to \$99,999	29,600	9,600	19,900	0	0	0	0	0	0	14
15	\$100,000 or more	5,000	1,700	3,300	0	0	0	0	0	0	15

	A	B	C	D	E	F	G	H	I	J	
Row	Characteristics	Present in 2004	2004 units present in 2011	Change in characteristics	2004 units lost due to conversion/merger	2004 house or mobile home moved out	2004 units changed to nonresidential use	2004 units lost through demolition or disaster	2004 units badly damaged or condemned	2004 units lost in other ways	Row
	Owner monthly housing costs										
16	Less than \$350	141,100	28,000	112,300	0	0	0	0	200	500	16
17	\$350 to \$599	173,200	66,400	105,500	300	0	0	200	200	700	17
18	\$600 to \$799	85,900	13,400	72,100	0	0	0	200	0	200	18
19	\$800 to \$1,249	167,100	59,300	107,300	0	0	0	200	200	0	19
20	\$1,250 or more	138,500	96,500	41,500	0	0	0	400	0	0	20
	Owner household income										
21	Less than \$15,000	99,300	19,300	79,400	0	0	0	0	0	500	21
22	\$15,000 to \$29,999	124,100	31,600	92,100	0	0	0	200	200	0	22
23	\$30,000 to \$49,999	139,100	27,600	110,400	0	0	0	200	400	400	23
24	\$50,000 to \$99,999	220,600	95,100	124,500	300	0	0	200	0	400	24
25	\$100,000 or more	122,700	66,100	56,200	0	0	0	400	0	0	25

Backward-Looking Table A: Housing Characteristics, Pittsburgh

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
1	Housing stock	1,104,900	1,047,400	0	1,700	600	2,600	49,700	1,400	1,500	1
	Occupancy status										
2	Occupied	992,700	874,400	66,800	1,300	0	1,900	46,800	1,000	600	2
3	Vacant	103,800	22,100	76,600	400	600	800	2,000	400	900	3
4	Seasonal	8,400	1,500	6,000	0	0	0	900	0	0	4
	Units in structure										
5	1, detached	767,400	731,700	0	0	0	2,100	32,800	400	400	5
6	1, attached	84,000	69,500	0	400	0	0	13,200	400	400	6
7	2 to 4	86,600	84,200	0	1,300	0	0	600	600	0	7
8	5 to 9	37,000	35,900	0	0	0	500	0	0	600	8
9	10 to 19	28,200	26,500	0	0	0	0	1,700	0	0	9
10	20 to 49	25,200	24,600	0	0	0	0	700	0	0	10
11	50 or more	33,200	33,200	0	0	0	0	0	0	0	11
12	Manufactured/mobile home	43,300	42,000	0	0	600	0	700	0	0	12

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
	Year built										
13	2010–2014	7,600	500	0	0	0	0	7,200	0	0	13
14	2005–2009	36,300	500	0	0	0	0	35,400	400	0	14
15	2000–2004	35,800	31,000	0	0	0	0	4,700	0	0	15
16	1995–1999	30,100	28,200	0	0	0	0	1,900	0	0	16
17	1990–1994	47,500	47,000	0	0	0	0	500	0	0	17
18	1985–1989	45,600	44,500	0	0	600	500	0	0	0	18
19	1980–1984	38,100	36,900	0	600	0	0	0	600	0	19
20	1975–1979	70,400	69,900	0	0	0	500	0	0	0	20
21	1970–1974	80,000	80,000	0	0	0	0	0	0	0	21
22	1960–1969	118,300	118,300	0	0	0	0	0	0	0	22
23	1950–1959	170,600	170,600	0	0	0	0	0	0	0	23
24	1940–1949	121,100	120,500	0	600	0	0	0	0	0	24
25	1930–1939	79,400	78,800	0	0	0	0	0	0	600	25
26	1920–1929	94,500	92,000	0	400	0	1,300	0	400	400	26
27	1919 or earlier	129,600	128,800	0	0	0	400	0	0	400	27

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
	Rooms										
28	1	7,500	6,400	1,100	0	0	0	0	0	0	28
29	2	5,200	2,400	2,800	0	0	0	0	0	0	29
30	3	87,500	57,000	28,900	600	0	500	0	0	400	30
31	4	178,400	121,300	51,400	600	0	0	3,500	600	1,000	31
32	5	224,100	121,600	94,300	400	0	900	6,800	0	0	32
33	6	239,100	123,000	105,000	0	600	0	10,100	400	0	33
34	7	177,800	83,100	83,100	0	0	1,300	9,900	400	0	34
35	8	106,800	44,000	53,400	0	0	0	9,400	0	0	35
36	9	47,300	12,900	29,200	0	0	0	5,200	0	0	36
37	10 or more	31,100	13,300	13,000	0	0	0	4,800	0	0	37
	Bedrooms										
38	None	11,200	7,400	3,800	0	0	0	0	0	0	38
39	1	108,800	86,900	20,300	600	0	500	0	0	400	39
40	2	300,000	230,900	58,200	1,100	0	400	7,800	600	1,000	40
41	3	477,200	384,800	70,000	0	600	500	20,900	400	0	41
42	4 or more	207,700	141,200	43,900	0	0	1,300	21,000	400	0	42
43	Multiunit structures	210,200	204,400	0	1,300	0	500	3,000	600	600	43
	Stories in structure										
44	1	10,700	10,100	0	0	0	500	0	0	0	44
45	2	53,200	52,600	0	0	0	0	600	0	0	45
46	3	92,400	88,200	0	1,300	0	0	1,800	600	600	46
47	4 to 6	32,400	31,800	0	0	0	0	600	0	0	47
48	7 or more	21,600	21,600	0	0	0	0	0	0	0	48

Backward-Looking Table B: Unit Quality, Pittsburgh

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
1	Occupied units	992,700	874,400	66,800	1,300	0	1,900	46,800	1,000	600	1
2	With complete kitchen	980,100	857,700	70,900	1,300	0	1,900	46,800	1,000	600	2
3	Lacking complete kitchen facilities	12,600	2,500	10,100	0	0	0	0	0	0	3
4	With complete plumbing	983,800	862,100	70,200	1,300	0	1,900	46,800	1,000	600	4
5	Lack some plumbing	8,900	1,100	7,800	0	0	0	0	0	0	5
6	No hot piped water	1,800	0	1,800	0	0	0	0	0	0	6
7	No bathtub/shower	1,300	0	1,300	0	0	0	0	0	0	7
8	No flush toilet	1,300	0	1,300	0	0	0	0	0	0	8
9	No exclusive use	7,100	600	6,500	0	0	0	0	0	0	9
	Water										
10	Public/private water	883,700	764,000	69,900	1,300	0	1,900	45,100	1,000	600	10
11	Well serving 1 to 5 units	94,100	86,700	5,700	0	0	0	1,700	0	0	11
12	Other water source	14,900	13,700	1,200	0	0	0	0	0	0	12
	Sewer										
13	Public sewer	835,000	692,700	95,800	600	0	1,900	42,400	1,000	600	13
14	Septic tank/cesspool	157,100	138,500	13,500	600	0	0	4,400	0	0	14
15	Other	700	0	700	0	0	0	0	0	0	15

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
16	Severe problems	15,900	1,100	14,800	0	0	0	0	0	0	16
17	Plumbing	8,900	1,100	7,800	0	0	0	0	0	0	17
18	Heating	7,000	0	7,000	0	0	0	0	0	0	18
19	Electric										19
20	Upkeep										20
21	Moderate problems	22,400	1,900	20,500	0	0	0	0	0	0	21
22	Plumbing	2,700	0	2,700	0	0	0	0	0	0	22
23	Heating	800	800	0	0	0	0	0	0	0	23
24	Kitchen	12,600	2,500	10,100	0	0	0	0	0	0	24
25	Upkeep	11,600	500	11,100	0	0	0	0	0	0	25

Backward-Looking Table C: Occupant Characteristics, Pittsburgh

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
1	Occupied units	992,700	874,400	66,800	1,300	0	1,900	46,800	1,000	600	1
	Age of householder										
2	Under 65	724,800	545,500	134,900	1,300	0	1,000	40,500	1,000	600	2
3	65 to 74	118,000	25,600	90,300	0	0	0	2,200	0	0	3
4	75 or older	149,900	75,800	69,100	0	0	900	4,100	0	0	4
	Children in household										
5	Some	278,800	150,200	102,200	600	0	400	23,800	1,000	600	5
6	None	713,900	534,100	154,600	600	0	1,500	23,000	0	0	6
	Race and ethnicity										
7	White alone	918,900	800,700	71,700	600	0	1,400	44,100	400	0	7
8	Hispanic	16,100	5,300	9,800	0	0	0	500	400	0	8
9	Non-Hispanic	902,800	784,700	72,500	600	0	1,400	43,600	0	0	9
10	Black alone	58,600	29,200	26,100	600	0	500	1,000	600	600	10
11	Hispanic	1,700	1,100	0	0	0	0	0	600	0	11
12	Non-Hispanic	56,900	27,500	26,700	600	0	500	1,000	0	600	12
13	American Indian or Alaska Native alone	900	500	500	0	0	0	0	0	0	13
14	Asian alone	8,400	3,700	3,000	0	0	0	1,600	0	0	14
15	Pacific Islander alone	500	500	0	0	0	0	0	0	0	15
16	Two or more races	5,500	1,400	4,100	0	0	0	0	0	0	16
17	Hispanic or Latino (any race)	18,200	6,900	9,800	0	0	0	500	1,000	0	17

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
	Income sources of families and primary individuals										
18	Wages and salaries	677,800	509,300	123,600	600	0	500	42,300	1,000	600	18
20	Dividends, interest, or rent	263,400	124,100	116,800	0	0	0	22,100	400	0	20
21	Public assistance or public welfare	32,300	5,700	24,900	600	0	0	500	0	600	21

Backward-Looking Table D: Income and Housing Cost, Pittsburgh

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
1	Occupied units	992,700	874,400	66,800	1,300	0	1,900	46,800	1,000	600	1
	Tenure										
2	Owner-occupied	701,500	615,200	43,700	0	0	400	41,700	400	0	2
3	Homeownership rate	70.7%									3
4	Renter-occupied	291,200	190,200	92,100	1,300	0	1,500	5,000	600	600	4
	Renter monthly housing costs										
5	No cash rent	19,400	3,500	14,800	0	0	500	600	0	0	5
6	Less than \$350	36,400	18,900	16,300	600	0	0	0	0	600	6
7	\$350 to \$599	70,000	26,700	41,600	600	0	500	0	600	0	7
8	\$600 to \$799	86,800	21,500	64,600	0	0	0	600	0	0	8
9	\$800 to \$1,249	66,200	10,900	53,500	0	0	0	1,900	0	0	9
10	\$1,250 or more	12,400	1,200	8,900	0	0	500	1,900	0	0	10
	Renter household income										
11	Less than \$15,000	90,000	37,200	50,900	600	0	0	700	0	600	11
12	\$15,000 to \$29,999	75,400	16,300	56,900	0	0	1,000	600	600	0	12
13	\$30,000 to \$49,999	64,700	11,600	52,500	0	0	0	600	0	0	13
14	\$50,000 to \$99,999	52,100	9,700	39,400	600	0	500	1,900	0	0	14
15	\$100,000 or more	9,100	1,700	6,100	0	0	0	1,300	0	0	15

	A	B	C	D	E	F	G	H	I	J	
Row	2011 characteristics	Present in 2011	2011 units present in 2004	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 2004 stock	2011 units added in other ways	Row
	Owner monthly housing costs										
16	Less than \$350	54,300	28,200	26,100	0	0	0	0	0	0	16
17	\$350 to \$599	174,300	66,900	106,500	0	0	0	900	0	0	17
18	\$600 to \$799	92,500	13,600	73,300	0	0	400	5,300	0	0	18
19	\$800 to \$1,249	159,000	59,500	93,300	0	0	0	6,200	0	0	19
20	\$1,250 or more	221,300	99,000	92,500	0	0	0	29,400	400	0	20
	Owner household income										
21	Less than \$15,000	62,900	18,300	43,600	0	0	0	1,100	0	0	21
22	\$15,000 to \$29,999	109,800	32,000	75,000	0	0	0	2,800	0	0	22
23	\$30,000 to \$49,999	122,800	27,400	89,400	0	0	400	5,600	0	0	23
24	\$50,000 to \$99,999	240,800	96,500	130,300	0	0	0	13,600	400	0	24
25	\$100,000 or more	165,200	68,500	77,900	0	0	0	18,700	0	0	25

Forward-Looking Rental Dynamics Table 1: Counts, 2004–2011, Pittsburgh

Affordability categories	A Total in 2004	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	75,600	44,500	1,200	11,700	3,700	2,900	500	0	0	7,300	2,500	1,300
Extremely low rent	42,100	2,900	7,100	18,400	3,200	1,200	500	600	0	3,700	1,900	2,500
Very low rent	116,700	5,800	2,200	54,300	22,300	9,400	2,400	0	0	13,600	4,700	2,100
Low rent	37,800	1,900	1,100	3,500	9,700	15,200	1,300	0	0	2,600	1,800	600
Moderate rent	21,300	1,700	600	1,200	4,400	5,200	3,800	0	0	2,400	1,900	0
High rent	1,600	0	500	0	0	700	500	0	0	0	0	0
Very high rent	2,700	0	0	600	0	500	600	0	0	600	500	0
Extremely high rent	600	0	0	0	0	0	0	0	600	0	0	0
Total	298,400	56,800	12,700	89,700	43,300	35,100	9,600	600	600	30,200	13,300	6,500

Forward-Looking Rental Dynamics Table 2: Row Percentages, 2004–2011, Pittsburgh

Affordability categories	A Total in 2004	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	75,600	58.9%	1.7%	15.4%	4.9%	3.9%	0.6%	0.0%	0.0%	9.6%	3.3%	1.7%
Extremely low rent	42,100	7.0%	16.8%	43.8%	7.7%	2.9%	1.1%	1.5%	0.0%	8.8%	4.5%	6.0%
Very low rent	116,700	5.0%	1.9%	46.5%	19.1%	8.0%	2.0%	0.0%	0.0%	11.6%	4.0%	1.8%
Low rent	37,800	5.1%	2.9%	9.4%	25.6%	40.2%	3.4%	0.0%	0.0%	6.9%	4.8%	1.7%
Moderate rent	21,300	8.0%	3.1%	5.8%	20.8%	24.4%	17.6%	0.0%	0.0%	11.4%	8.8%	0.0%
High rent	1,600	0.0%	29.0%	0.0%	0.0%	42.0%	29.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Very high rent	2,700	0.0%	0.0%	22.7%	0.0%	16.9%	21.7%	0.0%	0.0%	21.7%	16.9%	0.0%
Extremely high rent	600	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Total	298,400	19.1%	4.3%	30.1%	14.5%	11.7%	3.1%	0.2%	0.2%	10.1%	4.4%	2.2%

Backward-Looking Rental Dynamics Table 1: Counts, 2004–2011, Pittsburgh

Affordability categories	A Total in 2011	B Non-market in 2004	C Extremely low rent in 2004	D Very low rent in 2004	E Low rent in 2004	F Moderate rent in 2004	G High rent in 2004	H Very high rent in 2004	I Extremely high rent in 2004	J Owner-occupied in 2004	K Seasonal or related vacant in 2004	L New construction	M Added in other ways
Non-market	75,000	43,100	3,000	5,800	1,800	1,700	0	0	0	13,800	3,600	600	1,600
Extremely low rent	15,700	1,100	6,900	1,700	1,100	500	500	0	0	2,700	500	0	600
Very low rent	115,300	11,500	17,700	53,700	3,900	1,200	0	600	0	20,100	4,700	600	1,200
Low rent	54,600	3,500	3,200	21,300	9,500	4,300	0	0	0	8,600	3,000	1,200	0
Moderate rent	47,700	2,900	1,200	8,800	14,300	5,200	600	500	0	11,000	2,600	600	0
High rent	12,100	500	500	2,100	1,200	3,500	500	600	0	1,100	500	600	900
Very high rent	2,300	0	500	0	0	0	0	0	0	500	0	1,300	0
Extremely high rent	2,100	0	0	0	0	0	0	0	600	1,500	0	0	0
Total	324,900	62,600	32,900	93,500	31,700	16,400	1,700	1,700	600	59,400	14,900	5,000	4,300

Backward-Looking Rental Dynamics Table 2: Row Percentages, 2004–2011, Pittsburgh

Affordability categories	A Total in 2011	B Non-market in 2004	C Extremely low rent in 2004	D Very low rent in 2004	E Low rent in 2004	F Moderate rent in 2004	G High rent in 2004	H Very high rent in 2004	I Extremely high rent in 2004	J Owner-occupied in 2004	K Seasonal or related vacant in 2004	L New construction	M Added in other ways
Non-market	75,000	57.4%	4.0%	7.7%	2.4%	2.3%	0.0%	0.0%	0.0%	18.4%	4.7%	0.8%	2.2%
Extremely low rent	15,700	7.1%	43.7%	11.1%	7.2%	3.3%	3.4%	0.0%	0.0%	17.4%	3.0%	0.0%	3.7%
Very low rent	115,300	10.0%	15.4%	46.6%	3.4%	1.0%	0.0%	0.5%	0.0%	17.5%	4.1%	0.5%	1.0%
Low rent	54,600	6.5%	5.8%	39.1%	17.3%	7.8%	0.0%	0.0%	0.0%	15.7%	5.6%	2.3%	0.0%
Moderate rent	47,700	6.0%	2.4%	18.3%	29.9%	11.0%	1.2%	1.1%	0.0%	23.1%	5.5%	1.3%	0.0%
High rent	12,100	4.5%	4.5%	17.6%	9.8%	28.5%	4.5%	4.6%	0.0%	9.1%	4.5%	5.0%	7.6%
Very high rent	2,300	0.0%	20.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.4%	0.0%	56.1%	0.0%
Extremely high rent	2,100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.9%	72.1%	0.0%	0.0%	0.0%
Total	324,900	19.3%	10.1%	28.8%	9.8%	5.0%	0.5%	0.5%	0.2%	18.3%	4.6%	1.5%	1.3%