

The Long-Term Dynamics of Affordable Rental Housing

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We hope the housing policy and research communities will find our report to be both helpful and intriguing and that our work will encourage more research using the longitudinal design of the American Housing Survey.

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Executive Summary

The Affordable Housing Stock: A Longitudinal Analysis

This project investigates the affordable rental housing market over the three decades from 1985 to 2013. It describes the sources of affordable rental housing, and the dynamic process by which housing units move into, and out of, the affordable rental stock. The ability of lower-income households to afford decent housing has been one of the central concerns of housing policy in the United States for three-quarters of a century; and housing assistance has long been recognized as part of the social safety net. However, housing assistance has never been an entitlement. Far more households are eligible for federal housing assistance, based on their income and household status, than receive assistance.

As of 2013, there were 18.3 million low-income renter households (defined officially as “very low income,” having incomes less than half the median income of their metropolitan area or rural county, adjusted for household size), of whom 4.5 million were receiving housing assistance through the programs of the U.S. Department of Housing and Urban Development, and about another 0.4 million through the Rural Housing Service of the U.S. Department of Agriculture. This leaves at least 13.4 million very low income households who are housed in the private market.

Clearly, much of the affordable rental stock is not assisted, although assisted housing is an important share of the affordable stock. Concomitantly, most low-income renter households are housed in the private market, without housing assistance. We estimate that 6.6 million of these 13.4 million found affordable rental housing, another 0.5 million used vouchers to afford costlier housing, and finally 6.3 million had to settle for units with moderate or high rents.

The affordable rental stock has received very little research attention, despite its importance. We do not know, for example, whether it was always affordable, or whether it has become affordable sometime after it was built; if the latter, we do not know what its original status was (owner-occupied, high-cost rental), how long it was in existence before it became affordable, or how long it remained affordable and what happened to it subsequently. These are important questions for housing policymakers.

In this study, we begin to answer these questions about the affordable rental housing stock. We describe the entire affordable rental stock, both assisted units and units not receiving assistance, over a period of almost thirty years. Our data set, the American Housing Survey (AHS) is a large longitudinal sample of the entire housing stock. The same units were re-surveyed every two years, in the odd-numbered years between 1985 and 2013. Thus we are able to check the changes in the affordable rental stock, through a comparative analysis of the stock at the beginning and end of the period, and through a dynamic analysis of the process of change during the period.

Our analysis looks in both directions, forward and backward. Starting in 1985 and looking forward, some of the affordable rental units will cease to be affordable rental units by

2013; some will have been upgraded, some converted to owner-occupancy, some demolished or vacant. Tracking the stock forward thus invites the impression that the affordable stock is shrinking. Starting in 2013 and looking backward, some of the affordable units were not affordable in earlier years; their rents have declined in real terms, or risen less rapidly than incomes, they used to be owner-occupied and are now rental, they may not have existed ten or twenty years earlier. Tracking the stock backward thus invites the impression that the affordable stock has been growing. Both perspectives can easily be misleading, taken by themselves; looking both forward and backward gives a better sense of proportion.

The end result is a backward analysis that starts with an accurate count of the 2013 rental housing stock, a forward analysis that starts with a good estimate of the 1985 rental housing stock, and good estimates in the intermediate years that reliably reflect the importance of various types of changes that have occurred in those years – the dynamics of the affordable rental housing stock.

This time period is particularly relevant for analyzing some issues relating to assisted housing. Changes in housing policy and programs during the early 1980s have an important implication for our research. Any housing unit that is identified in the AHS as assisted in 1985, and remains assisted for the next 28 years, is either a privately-owned project or public housing; after 1985 vouchers became the major form of new housing assistance. Also, shortly after 1985, the attention of policymakers turned to preserving the existing stock of privately-owned assisted housing. Preservation has continued to be a major objective of housing policy since. Our study provides information about what has happened to the stock of privately-owned assisted affordable rental housing, during the first 28 years of public policies to promote preservation of that stock, as well as what has happened to the affordable rental stock in general.

Key Findings

Our major conclusions are:

- The proportion of the housing stock that is rental housing affordable to lower income households has remained relatively constant over the 28 years studied, 14.8 percent in both 1985 and 2013 and never rising above 16.4 percent or falling below 14.5 percent.
- Public housing and privately-owned assisted projects were an important source, but never the predominant source, of affordable rental housing. Assisted housing projects accounted for 21.1 percent of affordable housing in 1985 and, with the shift of federal assistance from project-based assistance to vouchers, fell to 15.9 percent in 2013.
- With the growth of the housing stock, the number of affordable rental units rose from 15.0 million in 1985 to 19.7 million in 2013.
 - Additions to the housing stock barely surpassed permanent losses throughout the 28-year period. Sixty percent of the additions came from new construction; other types of additions, e.g., splitting one housing unit into two or more units or

conversions of non-residential structures into housing accounted for the remaining 40 percent.

- Filtration – the movement of moderate or high rent units into the affordable category – exceeded gentrification – the loss of affordable units to the moderate or high rent categories – between 1985 and 2013. Filtering added 4.6 million units to the affordable rental inventory and gentrification removed 1.7 million, for a net contribution of 2.9 million units to the affordable rental housing stock.
 - Another important source was the shift of units from the owner sector to affordable rentals. About 3.8 million units that were in the owner sector in 1985 became affordable rental units by 2013, while 1.8 million affordable rental units as of 1985 were in the owner stock in 2013, for a net contribution to the affordable rental stock of just under 2.0 million units.
- The share of affordable rental in the housing stock appears remarkably consistent given the perturbations in the housing market over the period. From 1985 to 1995 the housing market was more or less “normal;” from 1995 to 2005, there was a “homeownership boom,” and from 2005 to 2013 the housing market went through a period that brought back memories of the 1930s. Yet in both 1985 and 2013, 14.8 percent of the housing stock was affordable rental housing. When we look separately at changes over the three decades: 1985-1995, 1995-2005, and 2005-2013, we do see changes in the sources of affordable housing. Filtering was the largest source of additional affordable rentals in each of the first two periods; changes in tenure from owner to affordable rental accounted for the largest change after 2005.
 - The affordable rental stock displays both stability and turbulence over the period.
 - 6.2 million units were affordable in both 1985 and 2013. Of these, 3.2 million were always affordable, that is, affordable in each of the 15 surveys; and another 0.9 million were always either affordable or moderate-rent units. A further 0.3 million were affordable in all but one survey.
 - Besides the 3.2 million that were always affordable from 1985 to 2013, another 0.8 million units entered the stock after 1985 and were always affordable through 2013. Thus a total of 4.0 million units were always affordable, either from 1985 or from the year they entered the sample.
 - Assisted units accounted for about 75 percent of these always affordable units.
 - Of the 15.0 million units that were affordable in 1985, 4.1 million had become permanent losses by 2013.
 - While the number of affordable rentals never exceeded 19.7 million in any survey, 56.5 million units were affordable at least once during the period.
 - Not surprisingly, affordable rental units were found to be of lower quality than other rental units or owner units but, for the most part, affordable rental units were of acceptable quality.
 - Assisted housing units were generally of higher quality than unassisted affordable rental but the quality differential had virtually disappeared by 2013 as the assisted stock aged.

- The quality of the affordable rental stock improved steadily from 1985 to 2013, using both the standard measure of inadequacy reported in the AHS since the late 1980s and a more detailed measure developed for this analysis. This was also the case for moderate rent and high rent units, and for the owner stock.
- In addition to describing the changes between 1985 and 2013, we have calculated the amount of affordable rental housing provided *throughout* the period by each unit. A unit which is “always affordable” provides affordable rental housing more of the time than a unit which filters, or gentrifies, or changes tenure. During the entire period, there were about 535 million years of affordable rental housing -about 17.9 million units each year, on average: The largest contributors to affordable housing over these years are diverse and quite surprising,
 - The largest contributors to affordable rental housing throughout the 28 years were the 44 million units that were most often part of the owner stock but were affordable rental for less than half of their time in the housing stock. These units accounted for 24.4 percent of all affordable rental housing. On average, they were affordable rentals for 3 years out of the 30.
 - Another 5.8 million units served both the owner and renter sectors but were affordable rentals for half or more of their time in the housing stock. These units provided almost 18 years of affordable rental housing, on average, and accounted for 19.1 percent of all affordable rental housing. Together units that were both rental and owner (or seasonal) accounted for 43.5 percent of all affordable rental housing.
 - The 3.5 million assisted units accounted for 17.8 percent of all affordable rental housing.
 - The 20.8 million units that were permanently lost by 2013 accounted for 12.1 percent of all affordable rental housing.
 - The 2.8 million units that were always rental and affordable for half or more of their time in the housing stock accounted for another 10.3 percent.
 - The 6.1 million units that were always rental but affordable for less than half of their time in the housing stock accounted for another 6.3 percent. These last two categories encompass most units that filtered or gentrified.
 - Often filtration is thought of as a smooth process in which units move from high rent to moderate rent to affordable. We found only 1.1 million units that followed this path and they accounted for 2.6 percent of all affordable rental housing. Further analysis shows that 80 percent of these units were never high rent during the period studied.
 - The remaining 7.5 percent of all affordable rental housing were accounted for by private units that were always affordable, units that were always affordable except for one survey, and units that gentrified from affordable to moderate or high rent units.
 - Finally, 65.7 million units were never rental and another 3.3 million units were always either moderate or high rental.

- Looked at another way, one-third of all affordable rental housing was provided by units that were affordable rentals less than half their time in the housing stock.
- Over the 1985-2013 period, units built before 1970, units in small multifamily structures (2-19 units), and small units (efficiencies and one-bedroom units) were more likely to provide affordable rental housing. There were shifts over the period in how units of different characteristics served the affordable rental market as characteristics of the housing stock changed.
- In addition to the common criterion for affordability, we analyzed the changes in the affordable rental stock as defined by two alternative criteria: first, affordable to households with incomes of up to 60 percent of the local median income (the criterion of affordability for Low-Income Housing Tax Credit projects); second, incomes up to 80 percent of the local median (an income limit for assistance under some housing programs).
 - The higher the affordability criterion, the more important are additions to the housing stock as a source of affordable rental units, and less important are removals from the stock.
 - Similarly, the higher the criterion, the less important are changes in affordability. The 80 percent criterion classified as affordable all of the units in both the affordable and moderate categories under the 50 percent criterion.
- We also looked at the changes in seven large Metropolitan Statistical Areas (MSAs), with large samples, over the same period: New York/Nassau-Suffolk, Greater Los Angeles, Greater Chicago, Northern New Jersey, Philadelphia, Detroit, and Greater Oakland-San Francisco.
 - New York and Philadelphia were the only MSAs with about the same proportion of their stock being affordable rental housing at the beginning and end of the period, matching the national experience.
 - In the New York MSA, 58 percent of the 1985 affordable rental stock was also affordable in 2013, and 80 percent of those units were affordable in all 15 surveys, consistent with New York's large assisted housing stock.
 - Filtering net of gentrification accounted for 62 percent of the national increase in affordable rental housing. In Chicago, Northern New Jersey, and Philadelphia, filtering net of gentrification accounted for more than 100 percent, offsetting losses from other sources.
 - In these same MSAs, permanent losses exceeded additions; in New York and the California MSAs, additions exceeded losses.
 - In the Chicago MSA, the affordable rental stock increased by almost 10 percent between 1985 and 2013; nearly all of this increase occurred after 2005, as the national and local homeownership rates dropped. Filtering was the most important source of additional affordable rental housing; demolitions and other removals from the stock were twice as much as additions to the stock.
 - Detroit's affordable rental stock dropped by 20 percent from 1985 to 2013; losses exceeded additions by more than the overall decline.

- In the central cities of the three largest MSAs – New York, Los Angeles, and Chicago – Los Angeles added 16,000 affordable rental units, New York saw little change, and Chicago lost 49,000 units. Chicago lost 90,000 more units than it added. The largest structural component of the affordable rental stock was buildings with 50 or more units in New York; single-family detached homes in Los Angeles; 2-4 unit buildings in Chicago.
- The suburbs in all three MSAs saw very large increases in affordable rental housing, the most noticeable change in these areas.
 - In the New York suburbs, the major source of additional affordable rental units was filtering net of gentrification; in Los Angeles, additions net of losses; in Chicago tenure shifts from owner housing to affordable rental, net of the reverse.
 - The most common structural type of affordable rental housing was buildings with 2-to-4 units around New York, and single-family detached houses in Los Angeles and Chicago.

The remainder of this Executive Summary provides a Chapter-by-Chapter guide to the rest of the report.

Setting Up the Analysis: Data and Definitions (Chapter 2)

We use a sample of 65,540 housing units obtained from the American Housing Survey (AHS), which is sponsored by the U.S. Department of Housing and Urban Development (HUD) and conducted by the Census Bureau. The current AHS sample was drawn in 1985; 66 percent of our units come from the original sample. HUD and the Census Bureau add to the AHS sample with each survey to represent units that have entered the housing stock through new construction or by other means. The remainder of our sample comes from these additions through 2013, the end year of our analysis and the last year of data collection for this AHS sample.

Once a unit is in the AHS sample, the Census Bureau surveys the household occupying that same unit every two years, allowing one to observe changes in both housing units and their occupants over time. The observations are frequent – every two years – and cover a long period – since 1985. The sample is large and was carefully designed to represent the housing stock nationwide, and the information on both the housing units and its occupants is detailed and consistently reported. Like the Census Bureau, we weight each observation so that the sample of 65,540 observations can represent the 156 million housing units that were in the housing inventory for all or some of the years between 1985 and 2013. In order to adjust for some minor problems with the AHS sample, we have had to modify the pure weight assigned to each unit by the Census Bureau.

Our definition of affordable rental housing takes both costs and income into account. In our view, affordability improves (or worsens) as either housing costs decrease (or increase) or household incomes increase (or decrease). For the analysis in Chapters 3, 4, and 6, we use the following definition:

A rental unit is affordable if the sum of rent, utilities, and related costs, adjusted for the number of bedrooms, is less than or equal to 30 percent of 50 percent of local area median income.

“Fifty percent of local area median income” is the HUD definition of very-low income and is also the standard for eligibility for assisted housing. “Thirty percent” is the required contribution of income from tenants of assisted housing and is supposed to represent a reasonable boundary between what a family should spend for housing and what it should spend on other goods. The bedroom adjustment recognizes that an affordable rent for a two-bedroom unit would not be the same as an affordable rent for a one-bedroom unit. Chapter 5 explores two alternative definitions of “affordable:” one based on 60 percent of local area median income and one based on 80 percent.

To track the “career path” of a housing unit, we classify it as being in one of eight statuses at the time of each of the 15 AHS surveys from 1985 and through 2013. The eight statuses and the numbers we assign to them are:

- 0 Not yet in the sample
- 1 Affordable rental unit
- 2 Moderate rental unit
- 3 High rental unit
- 4 Owner unit
- 5 Seasonal unit or second home
- 7 Temporarily out of the housing stock
- 8 Permanent loss from the housing stock

A moderate rental unit is defined in a similar manner to an affordable rental unit: the sum of rent, utilities, and other costs must be “greater than 30 percent of 50 percent of local area median income, and less than or equal to 30 percent of 80 percent of local area median income.” A high-rent unit has housing costs “greater than 80 percent of local area median income.” We include vacant units in categories 1 through 3 if they are vacant for rent, vacant for rent or sale, or rented but not yet occupied, and in category 4 if they are vacant for sale only or sold but not yet occupied. All other vacancies, such as seasonal use only, are put into category 5. Temporary losses include units used for non-residential purposes or units needing repair to be habitable. By 2013, 7,447 of our sample units had become permanent losses.

Using these statuses, we identify 25,642 unique paths that our sample units took over the course of the 15 surveys. The most common path is “always owner-occupied” from 1985 through 2013. There are 12,279 sample units that take this path, 18.7 percent of the sample. The second most common is always affordable rental housing from 1985 through 2013; the 1,388 sample units that take this path constitute 2.1 percent of the sample. The next 14 most common paths are the others consisting of units that are always owner-occupied, once they enter the sample: units entering the sample in 1987, for example.

At the other end of the distribution, 22,488 units take unique paths; there is only one unit following the path. These unique paths constitute 34.3 percent of the sample, slightly more than were always owner-occupied once they entered the sample. Another 1,456 paths are followed by

only two units each. Put another way, 87.7 percent of the paths have only one unit, and another 5.7 percent are followed by only two units each. The career paths followed by housing units are many and diverse.

In the course of the study, we identified several special issues. We resolved them in ways that we considered appropriate for this study.

- **Missing data:** Not all units in the survey provided complete interviews. We filled in missing values for various questions using the same unit's status in an adjoining survey – taking the response from the nearest survey. If there were two surveys equally near with different responses, we chose the previous survey if the unit's control number were odd and the next survey if the control number were even. We had to allocate responses in one year for 12,041 units and in two or more years for 8,882.
- **Sample reduction:** for the 2007 and 2009 surveys, about 5,000 units were dropped from the sample for cost considerations. These units returned to the survey in 2011. We employed our allocation procedures for missing data to fill in responses for the two surveys.
- **Identifying assisted housing:** Until 2011 identification of assisted units had to be based on the household interviewee's response to questions about assistance. Although the data are imprecise from any one survey to the next, we were able to use the consistency of responses to identify assisted units in our first report. In 2011 and 2013, HUD-assisted units were identified by matching the address of the sample unit to the administrative records for HUD programs. Units which were either public housing or privately-owned assisted projects in 2011 or 2013 were identified as assisted back to 1985 or the first year in which the unit was part of the AHS sample using both our original approach (because some assisted units were removed from the housing stock before 2011, so the match does not find them) and also the newly available match data..
- **Median income adjustments:** In our first report, we used the median incomes calculated by HUD for its housing programs for metropolitan areas or non-metropolitan counties. In 2007, HUD changed its methodology, using the American Community Survey (ACS) rather than the most recent decennial census. In making this change, HUD observed that the income data from the ACS tended to be lower than the income data from the decennial census. We used the data from the 2005 and 2007 ACS surveys to make the 2007 and later local median incomes consistent with the 2005 and earlier local median incomes.
- **Variation in bedroom counts:** For almost half of our sample units, respondents provided the same count of bedrooms in each survey; slightly more than half (51.4 percent) had more than one count of the number of bedrooms. To see how serious this variation might be, we did an alternative analysis in which we limited the variation in bedroom counts.
- **Additional issues:** From time to time, the AHS for a given year contains information for some units that is not available in other years: a special mobile home sample in 2005, for example, and units added in 2011 to enhance the sample. We eliminated

these units from because we did not have information about them for each survey and could not use them as part of our longitudinal analysis.

The Affordable Rental Housing Stock from 1985 to 2013 (Chapter 3)

We calculate the total housing stock for the United States as about 100.9 million units in 1985 and about 132.8 million units in 2013, an increase of 31.6 percent over the 28 years. Of these units, 85.7 million were in the stock in both years. About 15.2 million units were removed from the 1985 stock by 2013; 52.8 million were added to the stock and another 1.0 million were units that were temporarily out of the housing stock in 1985 but in it in 2013 – “reversible losses.” (Another 6.6 million units were added to the stock after 1985, but were no longer in the housing inventory by 2013.) About half the losses (48.2 percent) were the result of demolitions; about two-thirds of the added units (67.2 percent) were new construction. These percentages are close to the changes between 1985 and 2005 observed in our earlier study.

The affordable rental housing stock amounted to 14.8 percent of the total stock in both 1985 and 2013, as mentioned in the key findings. In 2005, it accounted for 14.6 percent. Though the affordable ratio did not change, it is the product of two statistically significant changes: an increase in the share of the rental housing stock that was affordable (from 43.5 to 45.5 percent) and a reduction in the share of the housing stock that was rental (from 34.1 to 32.6 percent).

Of the 15.0 million affordable rental units in 1985, 6.2 million (41.7 percent) were also affordable in 2013. Another 4.1 million (27.1 percent) dropped out of the housing stock permanently, and 0.3 million were temporarily out of the stock in 2013. The others remained in the stock, but either were no longer affordable (1.7 million “gentrified” into higher-rent categories) or no longer rental (1.9 million became owner-occupied or for sale, and 0.8 million became seasonal or second homes).

Looking backward from 2013, of the 19.7 million affordable rental units in that year, 6.2 million are those that had been affordable in 1985. Of the other 13.5 million, about 4.3 million were additions to the housing stock after 1985 (2.6 million of them new construction). About 4.6 million high-rent or moderate-rent units had filtered down to become affordable. Changes in tenure resulted in 3.8 million owner-occupied units and 0.5 million second homes becoming affordable rental housing. About 0.2 million units that were temporarily out of the housing stock in 1985 had re-entered the stock and were providing affordable rental housing.

Thus the most common reason for losses from the affordable rental stock was that the unit was no longer providing housing; it was permanently lost. At the same time, the most common source of additional affordable rental housing was the higher-rent stock, although both additions to the stock and tenure changes from owner to affordable rental were also important.

Of the 4.7 million unit *net* increase in the affordable rental stock, only 0.3 million came from net additions to the housing stock; the other 4.4 million came as a result of changes within

the 1985 existing housing stock – 2.9 million from changes in the rent levels of the rental stock, and 1.7 million from tenure shifts between owned, URE, and rental housing. There were also about 0.1 million more 1985 units that were temporarily out of the housing stock in 2013 than there were 2013 units that had been temporarily out of the housing stock in 1985. The net increase from filtering is almost ten times the size of the net increase from new construction and demolitions, and other sources of additions or removals.

Clearly, there was much change in the affordable rental housing stock. At the same time, a substantial number of units – 3.2 million – were always affordable, in each of the 15 survey years between 1985 and 2013. This is just over half of the 6.2 million units that were affordable in both of those years. In addition, 0.8 million units that entered the stock after 1985 were affordable in every succeeding survey. Thus a total of 4.0 million units were always in the affordable rental stock, for as long as they were in the survey.

Of the 3.0 million units that were affordable in 1985 and 2013, but not always in between, 0.9 million were either affordable or moderate-rent units in each survey, and an additional 0.3 million were affordable in every survey but one, and in some status other than affordable in that one year.

Among the large number of units that filtered or gentrified, a rather small share of each group did so “monotonically.” If they filtered monotonically, they only moved down from a higher-rent to lower-rent status or they remained in the same status; they never moved back into a higher-rent status. If they gentrified monotonically, they only moved up to a higher-rent status or remained in the same status; they never moved back into a lower-rent status. About 620,000 of the 4.6 million that filtered did so monotonically, and about 150,000 of the 1.7 million that gentrified did so monotonically. In addition, about 500,000 units that entered the stock after 1985 as moderate or high-rent units filtered monotonically to become affordable by 2013, and about 250,000 units entered the stock as affordable and gentrified monotonically through 2013. Most units which filtered moved only from moderate rent to affordable (about 80 percent), and most units which gentrified moved only to the moderate rent category (about 75 percent).

The identification of units as assisted by respondents in the individual AHS surveys has generally been considered unreliable. In our first report, we analyzed the consistency of responses to the questions about assisted status, and were able to combine information from all 11 surveys to identify 2.186 million units as either being in public housing or in federally assisted, privately owned projects as of 1985. Of these, 1.954 million were in the housing inventory in 2005. The 1985 estimate is about 75 percent of the count of assisted units in public or private projects in 1985 from HUD budget data (2.945 million), and the 2005 estimate is about 80 percent of the HUD budget figure in that year (2.408 million). In 2011, the AHS began to identify units as assisted by matching the addresses of the sample units with the addresses of assisted housing projects, including both public housing and privately owned assisted projects in programs such as Section 8, Section 236, and smaller programs that funded the production of privately owned projects intended for occupancy by lower-income households. Subsequently the AHS repeated the matching process as part of the 2013 survey. We combined the units identified by this matching process with those we identified as assisted in our first report. We consider federally assisted units to be affordable by program rules and have included them in the

group of affordable rental units. Since most of the assisted units were already classified as affordable, classifying all of them as affordable increased the number of affordable rentals by less than three percent.

Our approach and the HUD matches both identify 1.5 million units as assisted. Our approach identifies 1.0 million additional units as assisted and the HUD matches identify 0.9 million additional units as assisted. Combined, the two approaches identify 3.5 million units as assisted. Our approach will find units assisted by the Department of Agriculture, units that were assisted by HUD but dropped out of the stock prior to 2011, and HUD assisted units that were missed in the match.

We calculate that the number of assisted rental units varied in a small range between 1985 and 2013. The largest number in any survey was 3.219 million in 1991; the smallest was 3.141 million in 2013. On average, there were 3.184 million assisted units, with a standard deviation of 11,000. Over the 15 surveys, the regression coefficient was a statistically insignificant decline of less than 4,000 units from one survey to the next.

Two points stand out. First, while the number of *assisted* rental units did not vary greatly between 1985 and 2013, the number of *affordable* rental units rose steadily, from just under 15 million units in 1985 to slightly less than 20 million in 2013. As a result, the percentage of the affordable rental stock that was assisted declined from 21.1 percent in 1985 to 15.9 percent in 2013.

Second, about three million units were always assisted between 1985 and 2013: 2.7 million that were in the stock in all 15 surveys, and about 280,000 that were added to the stock after 1985 and remained in the stock until 2013. As noted above, there were about 3.2 million units that were always affordable from 1985 to 2013, and another 800,000 that entered the stock after 1985 and were always affordable through 2013. Thus, assisted units accounted for about 75 percent of the units that were always affordable.

Vouchers are not a direct focus of our study, but they also play a major role in helping households obtain decent housing. Households with vouchers grew steadily from about 800,000 households in 1985 to about 2.4 million in 2013. Vouchers increase affordable rental housing to the extent that households use them to rent moderate or high rent units. We were able to examine this effect for 2011 and 2013. In those years, 20 to 25 percent of households with vouchers – about 500,000 households – rented moderate or high rent units.

Besides analyzing the change between 1985 and 2013, we divided our data into three time periods, 1985-1995, 1995-2005, and 2005-2013. From 1985 to 1995 the housing market was more or less “normal;” from 1995 to 2005, there was a “homeownership boom,” and from 2005 to 2013 the housing market went through a period that brought back memories of the 1930s. The affordable rental stock increased by about 1.7 million units (11.4 percent) in the first decade, by a further 1.8 million (10.7 percent) in the second decade, and by 1.2 million (6.6 percent) between 2005 and 2013. The affordable rental share of the housing stock was remarkably stable over these 28 years: 14.8 percent in 1985, 14.7 percent in 1995, 14.6 percent in 2005, and back up to 14.8 percent as of 2013. More than half of the affordable rental stock at

the beginning of each period was affordable at the end, unlike the full 28-year period, during which about 42 percent was affordable at both the beginning and the end. Filtering was the largest source of additional affordable rentals in each of the first two periods; changes in tenure was the largest after 2005.

The affordable rental stock in both 1985 and 2013 consisted predominantly of units in small buildings, either single-family houses or apartment buildings with two to four units. The share in these structures declined from about 60 percent in 1985 to about 55 percent in 2013. The single-family detached share declined from 32 percent to 27 percent. Units in the largest structures, those with 50 or more units, were less than 10 percent of the affordable housing inventory in both years. Affordable rental housing was more concentrated within smaller buildings than either moderate rent or high rent housing.

The affordable rental stock became older. The median age was 33 years (built in 1952) as of 1985 and 54 years (built in 1959) as of 2013. Construction of rental housing in general declined after changes in tax laws and in financial regulation in the late 1980s, and the moderate rent and high rent inventories also became older, more so than the affordable inventory.

The median size of affordable rental units, measured by number of bedrooms, increased over the period, from 1.9 to 2.1 bedrooms. There were fewer units with none, one or two bedrooms and more with three, four or five bedrooms in 2013.

The share of the affordable rental stock located in central cities declined from 46 percent to 42 percent between 1985 and 2013, while the share located in the suburbs increased from 29 percent to 35 percent. In 1985, less of the affordable rental stock was located in cities than was the case for either of the higher-rent categories; in 2013, slightly more was located in cities than was true for moderate rent housing; while over half of high rent housing was located in the cities.

In both years affordable rental housing was disproportionately located in the South and the Midwest, and disproportionately underrepresented in the West (and to a lesser extent the Northeast). The shares located in the South and the West both increased; the share located in the Northeast declined.

We also investigated the quality of the affordable rental stock, and the other three primary residence categories – moderate rental, high rent, owner. Using the quality criterion that has been standard since the late 1980s, the affordable rental has consistently the highest level of moderately or seriously inadequate units. But for all four categories, a much smaller share of the stock was seriously or moderately inadequate in 2013 than in 1985 – 10.4 percent in 2013, compared to 20.0 percent in 1985 for the affordable rental stock, for example. In addition, we also utilized an alternative standard developed by Eggers and Moumen that included 35 types of housing deficiencies that is reported in the AHS, and is scaled from 0 to 176, with higher scores indicating more problems. This more detailed classification showed similar results: Affordable rental units consistently had lower quality than the other categories, but all categories showed substantial improvement between 1985 and 2013. The proportion of affordable rental units with a score higher than 10 (out of a possible 176 – higher scores indicate more problems) dropped from 16.6 percent in 1985 to 5.7 percent in 2013. Throughout the period, assisted units were

generally of better quality than unassisted affordable units but the difference virtually disappeared by 2013.

Affordable Housing Throughout the Period (Chapter 4)

In addition to counting the number of affordable rental housing units in 1985 and 2013, and describing what happened to them between the earlier year and the later one, we have calculated the amount of affordable rental housing provided *throughout* the period by each unit. A unit which is “always affordable” provides affordable rental housing more of the time than a unit which filters, or gentrifies, or switches tenure. This chapter addresses the question: how much of the affordable rental housing over the entire period has been provided by housing units that have taken different paths – have been always affordable, or assisted, have gentrified or filtered, have changed from owner to rental or vice versa, have been added to the stock or demolished?

To look at affordable rental housing *throughout* the entire period, we developed the concept of *unit years* of housing. If 100 units furnish affordable rental housing for 10 years each, we record this activity as 1,000 unit years of affordable rental housing. We assume that the status of a unit observed by the AHS at a point in time, such as 1987, represents the type of housing supplied by that unit for the two years between AHS surveys, in this instance 1986 and 1987. We further assume that units in a given status in 1985 were also in that status in 1984. Thus we have 30 years of housing that are provided by a unit which is in the inventory for all 15 AHS surveys. From 1984 through 2013, we estimate that the housing stock furnished 3.6 billion unit years of housing, of which 535.7 million unit years (15.1 percent) were affordable rental housing.

While on average, units spent 15 percent of their time in the housing stock as affordable rentals, the average varied by unit characteristic. Units in small apartment buildings (both 2-to-4 unit and 5-to-9 unit structures) spent on average almost 40 percent of their unit years as affordable rental housing. Units in structures with 50 or more units were affordable about one-third of the time.

Older units also spent, on average, a substantially higher percentage of their unit years as affordable rental housing. Units built prior to 1950 were affordable rentals on average 21 percent of the time they were in the inventory; those built in 1990 or later were on average affordable rental less than seven percent of the time. Small units, those with two bedrooms or fewer, spent larger proportions of their time on average as affordable rentals than did larger units – 25 percent compared to seven percent. Finally, an analysis of how the provision of affordable rental housing varies by location suggests that preservation may be a more urgent concern in large metropolitan areas.

The future of affordable rental housing depends on many factors including household formation, income growth, new construction, and the size and composition of the existing housing stock. With this last factor in mind, we compared the composition of the housing at the

beginning of our period to the composition in 2013. The composition of the 2013 housing stock by structure type was quite similar to its composition in 1985, but the largest changes were not likely to increase the stock of affordable rental housing: Units in structures with 2-to-4 units declined by almost two percentage points of the stock between 1985 and 2013; single-family detached homes increased by over two percent of the stock. Units in 2-to-4 unit structures spent about 40 percent of their time in the housing stock as affordable rental – the highest share of any structure type; single-family detached homes spent the lowest share, less than seven percent. Also, smaller units, as measured by the number of bedrooms, became a less important share of the housing stock; one- and two-bedroom units are substantial shares of the affordable rental stock. Perhaps most importantly, the housing stock in 2013 contained a higher proportion of older units than the 1985 stock did at the beginning of the period. Older units spend a higher proportion of their time as affordable housing than new units, which may contribute to a larger affordable rental inventory in the future; however, an older stock may have more physical problems – an issue that we have not studied – and may be closer to the end of its useful life.

In this analysis, we focused on consistency in providing unit years of affordable rental housing. To produce a measure of consistency for every unit that was in the stock at some time from 1984 through 2013, we used the AHS to estimate the proportion of time that each unit spent as an affordable rental unit. From 1984 through 2013, almost half of all housing units never provided affordable rental housing; another one-third provided affordable rental housing for 20 percent or less of their time in inventory. At the other end of the distribution, only 2.5 percent of all units served exclusively as affordable rental housing for all of their time in the housing stock during this period, and an additional 0.8 percent were affordable more than 90 percent of their time in inventory.

The 4.2 percent of all units that were always affordable rental housing for at least 80 percent of their time in the inventory accounted for 25 percent of all the unit years of affordable rental housing. The 45 percent of units that served as affordable rental housing for less than half of their time in the inventory accounted for 43 percent of all the unit years of affordable rental housing. The 6.5 percent of all units that fell between these extremes provided 33 percent of the unit years of affordable rental housing. (The remaining 44 percent of the housing stock never provided any affordable rental housing.) Put simply, just over 10 percent of the housing stock provided 58 percent of the affordable rental housing between 1984 and 2013.

Federally assisted units, which in accord with program rules we consider to be always affordable as long as they are in the housing inventory, supplied 12.5 percent of the total number of affordable unit years, about half of the unit years provided by always affordable housing units. While federally-assisted units are a relatively small segment of the inventory, their role in supporting affordable rental housing is important.

In terms of tenure, units that were always rental accounted for 48 percent of the unit years of affordable rental housing. This means that more than half of the unit years of affordable housing were provided by units that were not always rental. In fact, units that were not always rental and were affordable less than half the time provided 24 percent of all unit years of affordable rental housing.

Within the units that were always rental, we analyzed the importance of units which filtered or gentrified monotonically to or from being affordable. These total 1.5 million units, about eight percent of the units which were always rental. They provided about 3.3 percent of the affordable rental housing unit years; units which filtered provided 2.6 percent and units which gentrified provided 0.7 percent. Units which filtered were affordable for about 12 years, on average; units which gentrified for not quite 10 years. This was slightly more than half the time that they were in the housing inventory.

In this calculation, we exclude the much larger number of units – 4.8 million - which filtered or gentrified between 1985 and 2013, but not monotonically. They are among 8.9 million units that were always rental and occasionally affordable. We classified these units on the basis of whether they were affordable more or less than half the time. (Those which were affordable for exactly half of the time were counted as “more than half.”) The 2.8 million units in the former category were affordable for more than two-thirds of their time in the housing stock and they provided 55 million unit-years of affordable rental housing, an average of 20 unit-years for each unit. The 6.1 million units in the latter were affordable about 20 percent of the time, and provided 33 million unit-years, an average of about 5 ½ unit-years per unit.

A much larger share of the inventory consisted of units that were *not* always rental but were rental for some part of the time. Using the same classification, there were 5.8 million units that were affordable half or more of the time they were rental; on average they were affordable for two-thirds of their time in the housing stock, and they provided 102 million unit-years of affordable rental housing, an average of 18 unit-years. The “less than half” category has the most startling results: it comprises 44.4 million units (more than any category except those that were never rental) that were affordable for 11 percent of the time they were in the housing stock, less than three unit-years on average. These infrequently affordable units nonetheless provided 130 million unit-years of affordable rental housing, almost 25 percent of the total number of 536 million unit-years. These units differed from the other occasionally affordable units in several respects: They were newer, they were larger, and they were less likely to be located in central cities. Almost 60 percent were single-family detached homes. Units which were permanently lost during these three decades nonetheless provided affordable rental housing. They were in the inventory for about 11 years – slightly more than one-third of the 30-year period. While they were in the inventory, they provided affordable housing between 25 and 30 percent of the time, and provided 12.1 percent of the total number of affordable rental housing unit years over the period. Units which were demolished or lost through disaster, and even more so those lost through structural conversion or merger, were predominantly rental units, and usually affordable while they were rental. Units lost because they were moved to another location, mostly mobile homes, are predominantly in the owner stock.

Units which were added to the stock after 1985 were in the inventory about half the time – 14.5 years, on average. Over the 30 years, additions to the housing stock furnished about 22 percent of the total unit years of housing but only 13 percent of all the unit years of affordable rental housing. Additions “by other means” were a more fruitful source of affordable housing than newly constructed units. New units spend on average only 6.4 percent of their time in inventory as affordable rentals whereas other additions spent 14.5 percent. While losses spent twice as much time in the inventory as affordable rentals than did additions, additions accounted

for more unit years of affordable rental housing because there were 12.0 million losses and 39.9 million additions.

Units which followed these various more complicated paths accounted for almost 60 percent of all affordable unit years. Units which were not always rental, and were affordable less than half the time that they were rental, nonetheless provided 24 percent of the total number of affordable rental unit years – more than units which were always affordable. They were infrequently affordable – about two to three years on average – but they account for over one-quarter of the total number of housing units that were ever in the inventory during the period. From the perspective of promoting affordable housing, this presents a conundrum; almost a quarter of the affordable rental housing comes from units that are affordable only 12 percent of the time and that are not strictly – indeed, not usually – rental units.

Studying housing throughout the period furnishes some insights relevant to preserving affordable rental housing. One important dimension of preservation activity has been efforts to prevent the loss of affordable units in federally housing through demolition or the conversion to market-rate housing. This report documents that the public housing stock and the inventory of privately-owned, federally assisted projects combined to contribute almost 18 percent of the unit years of affordable rental housing, and over three-quarters of the unit years of those units that were always affordable or almost always affordable.

Local activity has also focused on preserving buildings that have historically provided affordable rental housing. This report documents that there were 2.2 million non-federally assisted units that furnished affordable housing on an always or almost always basis. Both these units and federally assisted units are generally easy to identify at the local level.

Preserving units that have provided affordable rental housing for most of their recent history makes good sense because experience indicates that these units will continue to provide affordable housing. Targeting for preservation units in 2-to-4 unit structures and units that are 55 years old or older also makes sense because units with these characteristics had a proclivity to provide affordable rental housing over the period from 1984 through 2013.

At the same time, however, there were 50.6 million units that also provided affordable rental housing but not on a consistent basis. They spent less than 20 percent of their time in inventory as affordable rentals. Their combined contribution was an impressive 164 million unit years of affordable housing, over 30 percent of the total. But preserving units which are so infrequently affordable might produce a small payoff for the costs and efforts involved.

Alternative Definitions of “Affordable” (Chapter 5)

In addition to the common criterion for affordability, we analyzed the changes in the affordable rental stock as defined by two alternative criteria: affordable to households with incomes of up to 60 percent of the local median income, and with incomes of up to 80 percent. The former is the criterion for affordability under the Low-Income Housing Tax Credit (LIHTC),

the latter has been an income limit for assistance under some housing programs, and has also been used as an upper bound for “workforce” housing.

The choice of standards has a dramatic effect on the number of rentals classified as affordable. Under the 50 percent standard, 15 million rental units were affordable in 1985; under the 60 percent standard, 20 million were affordable; and under the 80 percent standard, 28.3 million were affordable. The numbers for 2013 were 19.7 million, 26.8 million, and 36.1 million, respectively. For the 50 percent criterion, the share of the rental stock that was affordable increased over the period from 43.5 to 45.5 percent. For the 60 percent criterion, the share increased insignificantly between 1985 and 2013; it was about 20 percent in both years. For the 80 percent criterion, the share decreased, from 28 percent to 27 percent.

As the affordability criterion is raised, additions to the housing stock become a more important source of affordable rental units, and removals from the stock are a smaller share of the 1985 stock. Additions net of losses constitute 6.4 percent of the increase from 1985 to 2013 under the 50 percent criterion, 21 percent under the 60 percent criterion, and nearly half (48 percent) for the 80 percent criterion. The LIHTC might have contributed to the net additions under the 60 percent criterion. To claim the tax credit, projects must be targeted to households with incomes of 60 percent or less of the local median, but this is not supported by all of our findings. It would be very desirable to identify tax credit units that are part of the AHS sample, by matching the addresses in HUD’s LIHTC database to the addresses of sample units.

Filtering and gentrification are somewhat less important by the 60 percent criterion than by the 50 percent criterion, and much less important by the 80 percent criterion. The 80 percent criterion classifies twice as many units as affordable as the 50 percent criterion - both the moderate rental units and the affordable rental units according to the 50 percent criterion. Units that filter and gentrify between “moderate” and “affordable” under the 50 percent criterion are classified as “always affordable” under the 80 percent criterion. There is much less fluctuation within the rental stock in general under the 80 percent criterion.

There is, however, a wide gap between affordability for households with incomes of 50 percent of the local median, or less, and affordability for households with incomes of 80 percent of the local median. Using national data for 2013 as an illustration, a unit with a rent of \$1,045 would be counted as “affordable” under the 80 percent criterion, but a household with an income of 50 percent of the median would have to devote almost half of its income to rent, and a household with an income of 48 percent or less of the median would have to devote more than half. We believe that the 50 percent criterion is the best indicator of “affordability.”

Changes in Some Large Metropolitan Areas (Chapter 6)

In addition to analyzing the changes in affordable rental housing for the nation as a whole, we have looked at seven large Metropolitan Statistical Areas (MSAs) over the same period: New York/Nassau-Suffolk, Greater Los Angeles, Greater Chicago, Northern New Jersey, Philadelphia, Detroit, and Greater Oakland-San Francisco. Five of these areas were also included in our first report (but with some differences in boundaries): New York, Los Angeles, Chicago, Philadelphia, and Detroit. These all have samples of more than 1,000 units. In addition

to reporting findings for these MSAs, we also look at the central cities and the suburban areas for the three largest MSAs: New York, Los Angeles, and Chicago

Unlike the national experience, only two of these seven MSAs had about the same share of their housing stock devoted to affordable rental housing in 1985 and 2013: New York and Philadelphia. Detroit experienced a large reduction, from 16.6 percent to 12.0 percent of its housing stock, and Oakland-San Francisco had a large increase, from 9.5 percent to 15.2 percent.

Over half the 1985 affordable rental stock was also affordable in 2013 in New York (58.5 percent). The percentages for the other MSAs ranged from 26.1 percent in Detroit to 44.1 percent in Oakland-San Francisco. Chicago's percentage was 39.0 percent. Permanent losses from the 1985 affordable rental stock ranged from 11.3 percent in Los Angeles to 39.8 percent in Detroit; Chicago lost 31.4 percent. Nationally, 41.7 percent was affordable in both years, and 15.1 percent was permanently lost to the housing stock by 2013

Nationally, filtering net of gentrification accounted for 62 percent of the increase in affordable rental housing. In three of these metropolitan areas, filtering net of gentrification accounted for more than 100 percent of the increase (Chicago, Northern New Jersey, and Philadelphia); in Oakland-San Francisco, filtering accounted for 66 percent. Filtering mattered much less in New York and Los Angeles; in Detroit, there was a net decline of more than 20 percent in the affordable rental stock.

Additions to the affordable rental stock exceeded permanent losses nationally, providing 6.4 percent of the increase in affordable rental housing. In three of these metropolitan areas, permanent losses exceeded additions (Chicago, Northern New Jersey, and Philadelphia); in Detroit, losses exceeded additions by more than the overall decline in the affordable rental housing stock. In the two California metropolitan areas, substantial shares of their increases in the affordable rental stock resulted from new construction; in New York, the net increase from additions and losses accounted for 10 percent of the overall increase in the affordable rental stock.

Nationally, of the units that were affordable in both 1985 and 2013, over half were affordable in every survey in between. In New York and Los Angeles, the proportion was markedly higher – 80 percent and 69 percent, respectively. In Chicago and Philadelphia, it was much lower – about one-third. In the other three metropolitan areas, it was slightly above the national figure. In all of these metropolitan areas, assisted units accounted for most or all of these always affordable units.

The structural distribution of affordable rental housing varies quite widely. In New York, almost half the affordable rental stock as of 2013 is in buildings containing 50 or more units; in all of the others, it is less than 20 percent. In Los Angeles and Detroit, single family detached homes are the largest component of the affordable rental stock; in the other four, buildings with two-to-four units are the most common. In all of these areas except Oakland-San Francisco the structure type that is most common in the affordable rental stock is also the most common in the higher rent stock. In Oakland-San Francisco, single-family detached homes are

slightly more common that two-to-four unit structures in the higher rent stock, and the reverse is the case for the affordable rental stock.

In the central cities of the three largest metropolitan areas, there was a decline of 49,000 affordable rental units in Chicago (13.3 percent of the 1985 stock) and 5,000 units in New York (0.8 percent); and an increase of 16,000 units in Los Angeles (7.2 percent). In all three, there was a decline between 1985 and 2005: 35,000 in Los Angeles, 14,000 in New York, and 49,000 in Chicago. (There was a further loss of 1,000 in Chicago between 2005 and 2013; the numbers for the shorter periods do not precisely add to the number for the full period because of rounding.) In New York and Los Angeles, more units gentrified than filtered; in Chicago as nationally, more units filtered than were gentrified. There were more permanent losses than additions to the affordable rental stock in New York City (by 10,000 units) and in Chicago (by 90,000); in Los Angeles, additions exceeded losses (by 22,000 units).

Looking at the history of the 1985 affordable rental stock, in all three central cities the largest component was units that were sometimes not rental – over 40 percent in New York and Los Angeles, over 70 percent in Chicago.

The structural category with the largest share of the affordable rental stock in the central cities was the same as in all three metropolitan areas; in New York and Chicago, this was also the largest structural category for higher rent units.

The suburbs in all three metropolitan areas saw a very large increase in affordable rental housing: 84,000 units in New York (a 76 per cent increase), 83,000 in Los Angeles (a 71 per cent increase), and 94,000 units in Chicago (a 109 percent increase). These large increases are the most noticeable changes in the suburban areas of their MSAs, as they are nationally. In Los Angeles and Chicago, the increase was larger during 1985-2005 than during 2005-2013; in New York, the opposite occurred. In Los Angeles and Chicago, there were also increases in both of the higher rent categories, to a smaller extent; in New York, the increase in affordable rental housing was nearly offset by declines in the other categories, particularly the high rent category.

In the New York and Chicago suburbs, about half of the 1985 affordable rental stock was also affordable in 2013; in Los Angeles, the proportion was about one-third. The largest contributing factor to the increases in the affordable rental stock was filtering net of gentrification in New York; additions to the stock net of permanent losses in Los Angeles; and tenure shifts from owner housing to affordable rental net of the reverse in Chicago.

In the suburbs of these metropolitan areas, the largest share (over half in each) of the 1985 affordable rental stock was sometimes not rental over the ensuing 28 years. And also, in the suburbs as in the cities of these metropolitan areas, the number of assisted units in 1985 and the number in 2013 were both as large or larger than the number that were always affordable.

Finally, the affordable rental stock in the suburbs consists of smaller structures than in the central cities. The most common structural type in the New York suburbs is buildings with two-to-four units; in Los Angeles and Chicago, it is single-family detached houses. In the higher rent categories, the most common structural type is single family detached houses in New York and

Los Angeles; in Chicago, it is buildings with five-to-nine units, by 1,000 more units than are in single-family homes.

Chapter 1. Introduction

This project investigates the affordable rental housing market over the three decades from 1985 to 2013. It describes the sources of affordable rental housing, and the dynamic process by which housing units move into, and out of, the affordable rental stock. The ability of lower-income households to afford decent housing has been one of the central concerns of housing policy in the United States for three-quarters of a century; the national housing goal, as most recently formulated in 1990, is “that every American family be able to afford a decent home in a suitable living environment.”¹ Programmatically, housing assistance has long been recognized as part of the social safety net and counted as a means-tested benefit, along with programs to provide food and medical care.

Affordable Housing and Low-Income Households

Unlike these programs, however, housing assistance has never been an entitlement. Far more households are eligible for federal housing assistance, based on their income and household status, than receive assistance. As of 2013, there were 18.3 million low-income renter households (defined officially as “very low income,” having incomes less than half the median income of their metropolitan area or rural county, adjusted for household size), of whom 4.5 million were receiving housing assistance through the programs of the U.S. Department of Housing and Urban Development, and about another 0.4 million through the Rural Housing Service of the U.S. Department of Agriculture.

At the same time, there were 19.7 million affordable rental units (defined as having rents no more than 30 percent of half the median income in the local area), but only 13.4 million of these were available to low-income renters, 11.5 million already occupied by low-income households and 1.9 million vacant. The remaining 6.3 million units were rented by higher income households.

Clearly, much of the affordable rental stock is not assisted, although assisted housing is an important share of the affordable stock. Concomitantly, most low-income renter households are housed in the private market, without housing assistance. Of the 18.3 million low-income renters, 4.4 million live in affordable housing with assistance, 7.1 million live in unassisted affordable units, 0.5 million use vouchers to live in moderate or high rent units, and 6.3 million occupy moderate or high rent units without assistance. (In this calculation, we presume that all recipients of housing assistance are very low income households, in accord with federal policy, but we recognize that some recipients are above the very low income criterion.) The affordable rental stock, however, has received very little research attention. We do not know, for example, whether it was always affordable, or whether it has become affordable sometime after it was built; if the latter, we do not know what its original status was (owner-occupied, high-cost rental), how long it was in existence before it became affordable, or how long it remained

¹ Section 101, Public Law 101-625 (Cranston-Gonzalez National Affordable Housing Act of 1990).

affordable and what happened to it subsequently. These are important questions for housing policymakers.

There is some theory and some evidence that units are commonly built for higher-income occupancy and gradually filter down through the quality spectrum and through the rent distribution.² But the extent to which such a process is the source of the affordable rental stock has not been systematically studied. It is not clear exactly what happens – where affordable rental units come from, and where they go.

Looking Forward and Backward

In this study, we begin to answer these questions about the affordable rental housing stock. We describe the entire affordable rental stock, both assisted units and units not receiving assistance, over a twenty-eight year period. Our data set, the American Housing Survey (AHS) is a large longitudinal sample of the entire housing stock, with the same units re-surveyed every two years, in the odd-numbered years. Thus we are able to check the changes in the affordable rental stock, through a comparative analysis of the stock at the beginning and end of the period, and through a dynamic analysis of the process of change during the period.

Our analysis looks in both directions, forward and backward. Starting in 1985 and looking forward, some of the affordable rental units will cease to be affordable rental units by 2013; some will have been upgraded, some converted to owner-occupancy, some demolished or vacant. Tracking the stock forward thus invites the impression that the affordable stock is shrinking. Starting in 2013 and looking backward, some of the affordable units were not affordable in earlier years; their rents have declined in real terms, or risen less rapidly than incomes, they used to be owner-occupied and are now rental, they may not have existed ten or twenty years earlier. Tracking the stock backward thus invites the impression that the affordable stock has been growing. Both perspectives can easily be misleading, taken by themselves; looking both forward and backward gives a better sense of proportion.

The end result is a backward analysis that starts with an accurate count of the 2013 rental housing stock, a forward analysis that starts with a good estimate of the 1985 rental housing stock, and counts in the intermediate years that reliably reflect the importance of various types of changes that have occurred in those years – the dynamics of the affordable rental housing stock.

The Housing Policy Context

² For example, James L. Sweeney, “A Commodity Hierarchy Model of the Rental Housing Market,” *Journal of Urban Economics* 1, no. 3 (June 1974): 288–323; and John C. Weicher and Thomas G. Thibodeau, “Filtering and Housing Markets: An Empirical Analysis,” *Journal of Urban Economics* 23, no. 1 (January 1988): 21–40.

Because housing assistance is not an entitlement, there are recurring policy issues – programs to increase the stock of affordable rental housing, programs to preserve the affordable rental housing already in existence, efforts to reduce the cost of providing additional housing. This time period is particularly relevant for analyzing several of these issues. Beginning in 1961, a series of programs were enacted to subsidize the construction of privately-owned rental housing for lower-income families. The latest of these, the Section 8 New Construction program, was repealed in 1983; by 1985, there were virtually no new privately-owned affordable housing projects being built. Moreover, there was very little public housing built after 1981. Between 1985 and 1996, about 89,000 new public housing units were constructed; since 1996, there have been none.

The only active public housing program in recent years has been HOPE VI, but that is not strictly an affordable housing program; it is intended to raze or rehabilitate the worst public housing projects, often replacing them with mixed-income housing. The only continuously active programs to build new assisted housing are small: the Section 202 program for the elderly and the companion Section 811 program for the disabled (the latter enacted in 1990). These programs have resulted in 200,000 additional affordable rental units.

The most important programs to increase the number of housing units receiving assistance since 1985 have been the Low-Income Housing Tax Credit (LIHTC), enacted in 1987, and the housing voucher. About 2.8 million units received tax credits and were placed in service by 2014, including both new and rehabbed units. Not all of these units are affordable, in our terms; the LIHTC sets a criterion of affordability at 60 percent of the local median income, rather than 50 percent. The other major assistance program has been the voucher; about 2.1 million additional vouchers were funded between 1985 and 2013. This assistance is tenant-based, rather than project-based. Voucher holders can move and take their voucher with them to their new unit, and they do move, frequently. Because the AHS is a longitudinal survey of housing units rather than households, we cannot track voucher holders over time.

These changes in housing programs during our study period have one very useful result for our research. Any housing unit that is identified in the AHS as assisted in 1985, and remains assisted for the next 20-plus years, is either a privately-owned project or public housing. This is useful because, at about the time that Section 8 New Construction was terminated, the attention of policymakers turned to preserving the existing stock of privately-owned assisted housing. The Hills-Reuss Commission (formally, the National Low Income Housing Preservation Commission) was created in early 1987, with the support of the Housing Subcommittees in both the Senate and the House of Representatives. The report of the Commission appeared in 1988. Legislative efforts to preserve the existing inventory of privately-owned projects also began in 1987, and have continued; the current policy of “marking to market” was established in the Multifamily Assisted Housing Reform and Availability Act (MAHRA) in 1998.

Our study provides information about what has happened to the stock of privately-owned assisted affordable rental housing, during the first 25 years of public policies to promote preservation of that stock, as well as what has happened to the affordable rental stock in general.

Outline of the Report

The next chapter describes the procedures that we have used to conduct the analysis of the affordable rental housing stock. We explain why “affordability” is defined in terms of the relationship between household income and rent level in a particular market, rather than as a single measure for the United States as a whole (as is done, for example, in the case of Food Stamps). We also describe the weighting procedures we have developed to extrapolate from the AHS sample to the housing stock as a whole, and explain why we use the weighted observations for the analysis, rather than the unweighted. As a check on our work, we compare our weighted sample to other Census data on the housing stock and its components. In addition, we describe the system of categorizing housing units that we use in the report, based on affordability status, tenure, and whether the unit is in the housing stock. Over the 28-year period, some units are lost to the housing inventory and others are added. Most of the losses occur because the units are demolished and most of the additions are newly built units, but a substantial minor fraction are lost or added for other reasons. These changes are reflected in the AHS, as some sample units are lost and others are added to the survey.

Chapter 3 presents our results for the national housing stock in general and the affordable rental stock in particular, comparing the composition of the stock for the beginning and ending years, and the changes over the period, looking both forward from 1985 and backwards from 2013 to see what happened to the affordable rental stock. In both years, affordable rental housing represented between 14 and 15 percent of the total housing stock; reflecting the growth of the stock, the number of affordable rental units increased from 15.0 million to 19.7 million over the almost three decades. This chapter devotes particular attention to units which were affordable in both 1985 and 2013, which comprise slightly less than half the total affordable stock in 1985, and to those units which were “always affordable,” classified as affordable in each survey year. It also discusses those rental units which were not affordable in 1985 but which “filtered” down to become affordable by 2013, and conversely, those units which were affordable in 1985 but were in higher rent classifications in 2013 (termed “gentrification,” for convenience).

The chapter takes a close look at assisted housing, particularly units which are “always assisted” or “nearly always assisted.” These units account for about four-fifths of the “always affordable” rental stock.

In addition to reporting the changes over the full 28-year period, this chapter splits the period into the three decades, 1985-1995, 1995-2005, and 2005-2013. This facilitates comparison of our results with other research that covers a shorter period, and it also reflects changes in housing and mortgage markets. The homeownership rate began rising sharply in 1994 and continued to rise until 2005, for instance. In particular, it allows us to focus on the uniquely turbulent period 2005 to 2013, which encompassed the financial crisis, the severe 2007-2009 recession, and the lackluster recovery.

Chapter 4 analyzes affordability in a different dimension: the number of years of affordable housing provided by units in the various categories over the three decades. Units which are always affordable have provided a much larger share of the affordable rental stock over the full period than they have in particular years. At the same time, a surprisingly large share of the affordable stock has come from units which are *not* affordable most of the time. This analysis also further refines the discussions of filtering and gentrification.

All of these discussions are based on the affordability criterion of being within reach of households at half the local median income – “very low income” as defined in many housing programs. Chapter 5 adopts alternative criteria: 60 percent of the local median (the income limit for LIHTC units), and 80 percent of the local median (the official definition of “low income,” which has been important for housing programs in the past, and is also used to encompass “workforce” housing).

It is a truism in the real estate market and among housing analysts that “all housing markets are local.” Fortunately, the AHS identifies units in a number of the larger Metropolitan Statistical Areas. The last chapter briefly reports the changes in affordable rental housing for 7 individual large MSAs: New York/Nassau-Suffolk, Greater Los Angeles, the Illinois portion of Greater Chicago, Northern New Jersey, Philadelphia, Detroit, and Greater Oakland-San Francisco). We also examine the more narrowly defined Chicago metropolitan area. We report data for the entire MSA, and then separate data for each central city and for its suburban area for the three areas with the largest samples, New York/Nassau-Suffolk, Greater Los Angeles, and Greater Chicago.

Chapter 2. Setting Up the Analysis: Data and Definitions

This is a methodology chapter – dull but necessary. The five sections of this chapter:

- Describe the American Housing Survey (AHS) and discuss why it is close to an ideal database for this research.
- Explain how we define affordability and why.
- Present the taxonomy we use to classify housing units.
- Discuss why we use weighted AHS data and explain how we constructed the weights.
- Describe other steps that we took to make the data more useful for the purposes of this study.

As previously mentioned, this is the second of two reports that we have produced on the dynamics of rental housing. This report differs in several important ways from the earlier report and this discussion of methodology highlights these differences.

- In this report, we use all the available data from the AHS sample drawn in 1985 and augmented in subsequent years. HUD and the Census Bureau conducted 15 surveys, one every two years, from 1985 to 2013. In 2015, the Census Bureau retired the 1985 sample and drew a new sample. This report exploits the longest tracking of housing units ever undertaken.
- In 2011, HUD and the Census Bureau began identifying which units were being subsidized through HUD's housing assistance program. We used this information to improve greatly our classification of units as assisted.
- In our research for the first report, we observed that frequently the number of bedrooms reported for a unit changed between surveys for no apparent reason. These changes have the potential of introducing noise into the analysis of rental dynamics. In this report, we tested how restricting variation in bedroom counts might affect our conclusions.
- Finally, we are making available to other researchers our data base, called the Hudson Institute File, including our weights and special analytical tools. We constructed a file containing data on 65,540 housing units from 1985 or their subsequent entry into housing stock to 2013. For each unit, the file contains key AHS variables from each survey and a number of variables that we created to facility our analysis, including weights. The File is accompanied by full documentation on how we constructed it and our variables.

In addition, this Chapter describes other methodological refinements introduced since our first report. Some of these refinements were made necessary by changes after 2005 in the AHS, and changes in HUD procedures for setting median incomes. Other refinements reflect lessons learned in our earlier analysis.

The American Housing Survey

The U.S. Department of Housing and Urban Development (HUD) initiated the American Housing Survey in cooperation with the Census Bureau in 1973. HUD manages the survey and provides funding; the Census Bureau performs all the work associated with the survey, including sampling, questionnaire design, maintaining survey procedures, collecting the data, and preparing reports. The AHS is really two surveys—a survey of the national housing stock and a collection of surveys of the housing stock in major metropolitan areas.

Between 1973 and 1981, the Census Bureau conducted the national surveys annually; from 1983 to the present time, the Census Bureau has carried out the AHS national survey every 2 years. The most recently published data come from the 2013 survey. The national surveys have samples that range from 50,000 to 60,000-plus housing units. Our research uses the national survey only.

Through 2009, HUD and the Census Bureau published lengthy reports from each national and metropolitan survey. Those reports are available in hard copy from HUD USER or the Census Bureau and in PDF® format from both the HUD USER and the Census Bureau Web sites.³ From 2005 through 2013, the Census Bureau has made comprehensive AHS-based tables available on its website. In addition, both HUD and the Census Bureau make available to analysts public use files containing the responses from individual housing units, after removing any information that might identify respondents.

The single most important feature of the AHS for studying the dynamics of rental housing is the *longitudinal* structure of the database. The AHS follows the same housing units over time. The sample used in this study was drawn in 1985. Once a unit is in the AHS sample, the Census Bureau surveys the household occupying that unit every two years. If the household changes, the Census Bureau interviews the new household; it does not follow the old household to a new housing unit. This longitudinal structure allows researchers to observe changes in both housing units and their occupants over time. One can observe a unit changing from being owner-occupied to renter-occupied, from being occupied by a high-income family to being occupied by a middle income household composed of unrelated individuals, and from being in excellent physical condition to having specific physical problems. One can also observe physical changes such as the addition of a porch or the remodeling of a kitchen.

³ www.HUDUSER.org and www.census.gov.

Other features of the AHS that were important for our research are:

- Frequent interviews over an extended period: We were able to follow housing units at two-year intervals from 1985 to 2013, employing information gathered in 15 surveys. For 2015, HUD and the Census Bureau drew a new sample. So, this study makes use of the entire period covered by the sample drawn in 1985.
- A large, statistically representative sample: Our results are based on a sample of 65,540 units. These units were drawn from 394 primary sampling units selected by the Census Bureau to represent the national housing stock
- A well-designed questionnaire that collects detailed information on both the housing unit and its occupants. With minor exceptions, this questionnaire has been administered consistently since 1985.
- A companion database – Housing Affordability Data System (HADS) – that provides useful information. HUD put together the HADS database to assist researchers in studying housing affordability. In particular, HADS uses a statistical procedure to estimate utility and related costs for vacant units so that their housing costs can be compared consistently with occupied units. HADS also includes some additional variables that were useful for our purposes

Defining Affordability

We define a rental unit to be *affordable* if:

the sum of rent plus utilities and other related costs, adjusted for the number of bedrooms, is less than or equal to 30 percent of 50 percent of local area median income.

This definition incorporates several decisions; the following paragraphs explain each of the decisions.

First, we include utilities and related costs in the calculation along with rent for two reasons. Utility costs are legitimate components of the costs of shelter. A unit must be heated, lighted, and made habitable. Also, failure to include these costs would make it impossible to compare the costs of rentals consistently because rents charged tenants vary in the extent to which they include utilities and other costs. By including all relevant costs in our measure, we put all rental units on the same basis. We used an AHS measure of housing costs that includes, in addition to rent, the cost of electricity, gas, fuel oil, other fuels (e.g. wood, coal, kerosene, etc.), garbage and trash, water and sewage, and property insurance. Rent plus all related costs is frequently referred to as *gross rent*.

Second, we chose to use local median income as a standard against which to compare housing cost. Our study of rental affordability involves judging housing costs across both space and time. We have to determine whether a gross rent of \$600 in 1999 is more or less affordable than a gross rent of \$500 in 1989 and whether a gross rent of \$450 in Wichita is more or less affordable than \$650 in Boston. We believe that having some standard for making credible judgments across time and space is not controversial but we recognize that our choice of this particular standard -- local area median income -- deserves further discussion.

The use of income as a standard implies that the affordability problem is not solely a housing market issue. We believe that, from a public policy perspective, improvements in affordability resulting from rising incomes are just as desirable as improvements resulting from a decline in real housing costs. For this and other reasons, we did not consider using cost of living adjustments or similar approaches to compare housing costs across time.

We believe that housing costs vary by location; for example, the same unit will rent for more in Boston than in Wichita. However, geographical variation is not the only reason we use *local* median income as the standard. If, as we believe, changes in affordability are the joint result of changes in income or housing costs, then the appropriate standard should incorporate the relevant income, that is, income in the local housing market.

There are legitimate concerns about the measurement of area median income. Forty-four percent of the units in our sample are located in metropolitan areas identified by the AHS. For these cases, we manually entered the area median incomes published by HUD annually. For the remaining cases, we used data available in HADS.⁴

The use of area median income is consistent with the approach used by HUD in its periodic ‘worst case needs’ reports to Congress and by government commissions on housing. The standard used to identify “worst case needs” is based on income, but uses 50 percent of 50 percent of the local median instead of 30 percent of 50 percent. It was affirmed in a 1990 report of the Senate Appropriations Committee: “families and individuals whose incomes fall 50 percent below an area’s median income, who either pay 50 percent or more of their monthly income for rent, or who live in substandard housing.”⁵

⁴ For sample cases not in identified metropolitan, HADS provided estimates of area median income by matching cases based on Census region, metropolitan status, and heating degree-days with weighted averages of HUD area median incomes grouped by similar characteristics.

⁵Committee Report to accompany H.R. 5158, The VA-HUD Appropriations Act for FY 1991 (S. Rpt. 101-474) as reported on page 7 of *Affordable Housing Needs 2005: Report to Congress*, May 2007, U. S. Department of Housing and Urban Development, <http://www.huduser.org/publications/affhsg/affhsgneed.html>.

Our “30 percent of 50 percent” parameters come from different sources. The “very low income” criterion currently used for determining eligibility to HUD assisted housing is “50% of area median income.” The “30 percent” language occurs in various places as the percentage of income that households should be expected to devote to shelter costs. In 1968, then-Senator Edward Brooke convinced Congress to mandate that no family should have to pay more than 25 percent of its income toward rent in federally assisted housing. In 1981, Congress changed the minimum payment to 30 percent of income. This change was primarily designed to reduce the costs of federally assisted housing but it presumes, at least implicitly, that households should be able to provide for their non-housing needs with 70 percent of their income.⁶ Chapter 5 examines alternative definitions based on 60 percent and 80 percent of area median income.

Finally, we adjust housing costs to reflect the size of the unit. In other words, we believe that what is considered affordable for a one-bedroom unit should be less than what is considered affordable for a two-bedroom unit. Federal housing policy has recognized this principle for years in the way it determines eligibility for assisted housing. Eligibility for assisted housing varies by household size, with larger households able to qualify at higher income than smaller households. Since we are looking at units and not households, the adjustment should be made on the housing cost side rather than the income side. We do this by following a technique espoused in HADS.⁷ This combines the HUD adjustment for household size with the rules of the low income housing tax credit program on expected size of household by number of bedrooms.

Rather than have only two classes of rental unit, affordable and not-affordable, we divided the non-affordable units into two groups, moderate rent units and high rent units:

- *Moderate rentals* are those where the sum of rent plus utilities and other related costs, adjusted for the number of bedrooms, is greater than 30 percent of 50 percent of local area median income but less than or equal to 30 percent of 80 percent of local area median income.
- *High rentals* are those where the sum of rent plus utilities and other related costs, adjusted for the number of bedrooms, is greater than 30 percent of 80 percent of local area median income.

⁶ For a fuller discussion of the origin of the “30-percent” standard, see *Trends in Housing Costs: 1985-2005 and the 30-Percent-of-Income Standard*, prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, by Econometrica, Inc., Frederick J. Eggers and Fouad Moumen, June 2008, pp 29-31. <http://www.huduser.org/portal/datasets/ahs/ahsprev.html>

⁷ The 2007 HADS documentation at http://www.huduser.org/intercept.asp?loc=/Datasets/hads/HADS_doc.pdf, pp 10-11.

Classifying Housing Units by Status

At different times, a housing unit can play different roles in the housing market. For example, a unit may be owner-occupied, renter-occupied, vacant, kept for seasonal use, or out of housing stock for remodeling. We think of the changing roles that a unit plays as its “career path.” To facilitate tracing out the various career paths that a unit can take, we define 8 conditions that a unit in our sample might be in at any given time. We call these conditions, *statuses*.

Table 2-1 lists the eight statuses and the numbers we use to identify them in our code. A code “6” – which is not included in Table 2-1 -- was used in the preparation of the data for analysis but was not used in the final analysis. The last section of this chapter explains this.

The Census Bureau drew the current AHS sample in 1985; 43,343 units in our working sample were in that initial draw. Since 1985, the Census Bureau has added 22,197 units to the sample to account for newly constructed housing units and units added to the stock by other means, such as units created when an existing unit is split into two or more units. Three-quarters of the additions to our sample were through new construction.

We define statuses 1 through 4 to include relevant vacant units. One goal of the study is to estimate the number of affordable rental units. Vacant affordable units should be included in that estimate.

In the AHS published reports, the housing stock is divided into seasonal units and year-round units. Year-round units, in turn, are divided into occupied units and vacant units. The vacant category include units vacant for rent, vacant for rent or sale, vacant for sale, sold or rented but not yet occupied, vacant for migratory works, and other vacancies. As noted in Table 2-1, we include vacancies among owner or renter stock units in statuses 1-4. Seasonal units, URE units, and other vacancies are grouped together in status 5.

The current Codebook for the AHS includes seven different ways a unit can be classified as a temporary loss from the housing stock plus a catch-all “other” category. The examples given in Table 2-1 involve non-residential uses or serious disrepair. Units are added to the sample when a permit is granted; until the unit is completed it is considered a temporary loss. However, a unit has to have been in the stock for at least one survey to be included in the sample we have worked with. So units that were never completed were excluded from our sample.

Table 2-1. Definition of Statuses for Housing Units

Code	Status Name and Definition
0	<i>Not in sample</i> : a unit not yet in the sample – a unit added to the sample after 1985 or the year studied, if after 1985. For example, a unit added to the sample in 1989 would have the status of 0 for 1985 and 1987.
1	<i>Affordable Rental</i> : a unit that (1) is renter-occupied, vacant for rent, vacant for rent or sale, or rented but not yet occupied and (2) has housing costs that are affordable by the definition in the preceding section.
2	<i>Moderate Rental</i> : a unit that (1) is renter-occupied, vacant for rent, vacant for rent or sale, or rented but not yet occupied and (2) has housing costs that are moderate by the definition in the preceding section.
3	<i>High Rental</i> : a unit that (1) is renter-occupied, vacant for rent, vacant for rent or sale, or rented but not yet occupied and (2) has housing costs that are high by the definition in the preceding section.
4	<i>Owner Stock</i> : a unit that is owner-occupied, vacant for sale only, or sold but not yet occupied.
5	<i>URE or Seasonal</i> : a unit that is a usual residence elsewhere (URE) – most often a second home – or a unit used seasonally or only occasionally or a unit (vacant or otherwise) used for migratory workers.
7	<i>Temporary loss</i> : a unit that is temporarily out of the housing stock, including units used for business purposes, units used for institutional purposes, and units unfit for habitation.
8	<i>Permanent loss</i> : a unit that has been permanently lost from the housing stock.

Interpreting the origin of units can be tricky. If a contractor draws a permit to convert a warehouse to residential units, the Census Bureau might select that permit and add one or more of the units to the sample as an addition other than new construction. On the other hand, if a unit already in the sample becomes the office of a tax preparer and then returns to the housing stock, it is treated as a temporary loss that has returned to the stock and not as an addition to the stock.

Units can become permanent losses in a variety of ways. The most common way – demolition or destruction by fire or natural disaster – involves the loss of physical capital. Other ways – the movement of mobile homes and, more rarely, houses – involve the loss of physical capital at a particular location. And still other ways – the merger of two units into one or the splitting of one unit into multiple units – involve a radical transformation of physical capital. The AHS tracks renovations and, not infrequently, sample units will add rooms or other major capital items between surveys. Units undergoing such changes remain in the sample, but when the transmogrification involves the creation or loss of existing units, the Census Bureau treats the change as the loss of

one or more units and the creation of one or more new units.⁸ One or more of the new units may be added to the sample but this does not happen in all circumstances. Disregarding the ambiguous “other” cases, disasters and demolitions account for approximately 60 percent of the losses. By 2013, 7,447 units in our sample were classified as permanent losses.

Using these 8 statuses, we construct a 15-digit variable that describes the career path for each unit in the sample, indicating its status in each survey from 1985 to 2005. For example, 1,388 sample units take path 111111111111111: these are rental units in the sample for all fifteen enumerations between 1985 and 2013 and meet the criteria for being classified as affordable for the entire time.

This career path variable enables us to observe both stability and variation in how housing units perform over time. Of the 65,540 units in the sample, 22,123 (33.8%) were always in the owner stock, once they entered the sample; and 8,296 (12.7%) were always in the rental stock (but not necessarily affordable). We observed 25,642 different paths; the 25 most frequently reported paths describe the careers of 38% percent of the units in our sample. On the other hand, there were 22,489 units that had unique paths, no other units had the same path. These unique paths constitute 34.3 percent of the sample, slightly more than were always owner stock. Put another way, 87.7 percent of the paths have only one unit. Another 1,456 paths (5.7%) are followed by only two units each. The mean number of units per path is 3.9; the median and the mode are 1.

Early in our work it seemed to us that if we could define a path, we would find that some housing unit had followed that path. This is an obvious exaggeration; there are far more possible paths than there are housing units in the United States. But there are certainly a great many paths, and the large majority of them are uncommon, to say the least.

Weighting

The AHS is a large, statistically representative sample of the nation’s housing stock and also the housing stock in a number of major metropolitan areas. HUD and the Census Bureau make the extensive information gathered in the AHS available in public use files so that independent analysts can study housing conditions and the operation of the housing market. Analysts can choose to use these data in either an unweighted or a weighted fashion. Unweighted analysis treats sample units as individual cases and would present results in language such as: “Of the 6,385 affordable rental units in the sample in

⁸ “Mrs. Faraday’s house was the eighth in a mid-nineteenth-century terrace on the south side of an Islington square. The houses, no doubt built originally for the superior working class, must have gone through the usual transmogrification of rising rents, neglect, war damage and multi-occupancy, but had long been taken over by those of the middle class who valued proximity to the City. ...” (P D James, *The Murder Room*, p. 206). This unit would have changed status at least five times, in our categorization, although it might also have dropped out of the inventory if “multi-occupancy” involved conversion to several smaller units.

1985, 2,693 were also affordable rental units in 2013.” Weighted analysis treats sample units as representing many similar units in the national housing stock and would present results in language such as: “Of the 14.5 million affordable rental units in the housing stock in 1985, 6.0 million were also affordable rental units in 2013.”

If the results were looked at in percentage terms, there would be only minor differences between weighted and unweighted analysis because the method used by the Census Bureau to draw the AHS sample results in 90 percent of the units having the same pure weights.⁹ In the example used to compare the unweighted and weighted analysis, the fraction of those units affordable in 1985 that were also affordable in 2013 would be 42.2 percent from the unweighted analysis and 41.8 percent from the weighted analysis.

We chose to study the creation and loss of affordable rental housing using *weighted* AHS data for three reasons. First, data on the extent to which rental housing is affordable have important implications for public policy and private efforts to help low income households obtain decent housing. These implications are clearest when expressed in terms of actual changes in the national housing stock. The statement that “by 2013, 3.9 million of the affordable rental units in 1985 had become permanent losses to the housing stock” conveys more forcefully the impact of permanent losses than the statement that “by 2013, 27 percent of the affordable sample rental units in 1985 had become permanent losses.” Second, using unweighted data could introduce minor errors into the results we report. While most of the sample units have the same pure weight (one sample unit equals approximately 2,148 national), 1 percent have significantly lower pure weights (less than 590) and 1 percent have significantly higher pure weights (more than 3,754). These units should not be treated as equally important as the other units in the sample. Third, our own analysis indicates that failure to weigh the sample units would result in underestimating the importance of mobile homes and units added to the housing stock between 1985 and 2013.

This third reason led us to make two adjustments of our own to the pure weights provided by the Census Bureau. In 2005, the Census Bureau dropped half of the mobile homes built before 2000 from the AHS sample and replaced them with an approximately equal number of newly sampled mobile homes built before 2000. We cannot use the replacement mobile homes because they were not in previous AHS surveys and therefore we cannot track the status of these units over time. For this reason, we have to increase the pure weights of the mobile homes built before 2000 that were kept in the sample so that they will represent accurately that component of the housing stock. After making this adjustment in our previous research, we compared our estimates of the distribution of the housing stock by year built to the distribution published in the 2005 AHS Report.

⁹ The Census Bureau provides both a pure weight (variable name PWT) and a regular weight (variable name WEIGHT) for each unit. The pure weight is the inverse of the probability of the unit being in the sample and does not change from survey to survey. The regular weight is a survey-by-survey refinement of the pure weight so that certain weighted subtotals for a given survey year equal counts available from other sources. The regular weights change from survey to survey and therefore are not useful for comparisons across surveys. Using regular weights, a sample unit might represent 2,150 units in 1993, 2,010 units in 1995, and 2,065 units in 1997.

This comparison indicated that the pure weights systematically underestimated the counts of units added to the stock since 1990. A second adjustment to the pure weights insured that our weighted counts by year built equaled those from the 2005 AHS Report for our first report. A similar procedure for 2013 was performed for this report.¹⁰

In this section, we explained that we use weighted counts throughout the report because we believe the weighted numbers provide better policy insight, because the AHS pure weights need to be adjusted for some units that are over- or under-represented in the sample, and because weighting allows us to correct for the elimination of some mobile homes from the sample in 2005 and for an underrepresentation of units added to the housing stock after 1985. All the reported analyses were also done using unweighted data so that we could verify the accuracy of the computations by tracking units from the beginning to the end of the computation. A detailed explanation of our weighting procedures is included with documentation of the Hudson Institute File.

Special Issues

Missing data: The Census Bureau is not always successful in obtaining completed interviews for all the units in the survey. Refusals, inability to contact residents, or language problems are some of the reasons that a unit in the sample might have data missing in one or more years. Missing data was mainly a problem with respect to our variable for the status of a unit. When we began working with the data, we use a status code of “6” to indicate that data on status was missing in that survey year.

Fortunately, the longitudinal character of the AHS made it easy to fill in missing status values reliably. If we were missing information on the status of a unit in a given survey, we would fill in the status using information on the same unit’s status in an adjoining survey. While the rules for filling in status values were complicated, the approach was simple.¹¹ We took the status from the nearest survey. If two surveys were equally near but had different statuses, then we chose the previous survey if the unit’s control number were odd and the next survey if the control number were even. We dropped cases if there were too many missing values for status or if there were no usable information on status within three surveys. For the 65,540 units in our sample, we had to allocate status in one year for 12,041 units and allocate status in two or more years for 8,809 units.

For the 2007 and 2009 AHS surveys, HUD and the Census Bureau dropped approximately 5,000 units from the sample to reduce survey costs. These units returned

¹⁰ In 2005, HUD and the Census Bureau added to the AHS survey units representing housing that provides “special living facilities” to the elderly. We dropped these units from our study because we had no history on them prior to 2005.

¹¹ The Hudson Institute File documentation contains the steps that we used to allocate values when the AHS public use files were missing values.

to the sample in 2011. We were able to use our allocation procedures to reclaim these units for analysis, albeit at the cost of an increased number of allocations.

Our allocation procedure interacts with our weighting in the following way. If a unit entered the sample in 2003 but was not interviewed in 2003, we were still able to use that unit because our allocation procedure allowed us to borrow information on that unit from the 2005 or 2007 surveys. But, for units that entered the sample in 2013 and were not interviewed, we have no other surveys from which we can borrow information and therefore we have had to drop these units from our analysis. This problem applied to a lesser extent to unit that entered the sample in 2009 and 2011. To prevent underestimating additions to the stock in 2009 and beyond, we had to make special adjustments to the pure weights of units added to the stock *and interviewed* for these surveys.

Identifying assisted housing: Unfortunately, until 2011 the AHS was not a satisfactory source of data on assisted housing. Many more households report receiving housing assistance in the AHS than are actually being assisted, according to HUD program data. The problems with the AHS in this regard have been recognized for many years. In our previous report, we endeavored to create a more reliable way to identify assisted housing by using responses to the assistance questions from multiple AHS surveys. For example, if households said that they lived in an assisted unit in 9 of the 11 surveys, we would classify that unit as assisted.¹²

HUD and the Census Bureau began releasing information on address matches between AHS sample units and HUD assisted units in the public use files for the 2011 and 2013 surveys. This change greatly improved our ability to identify assisted units. The new AHS variable classifies rental units into 4 groups: public housing, voucher recipients, units in privately-owned HUD assisted housing, and rental units receiving no HUD assistance. The voucher program has become the largest HUD rental assistance program but it is not relevant for our purposes because the assistance goes to the household rather than the units. If the household moves, then the assistance moves from one unit to another. We are studying rental units that are affordable in and of themselves, regardless of who occupies the unit. Units in public housing and privately-owned HUD assisted projects are affordable, by definition, for as long as the unit remains in the stock.

We used the new HUD information to identify units in public housing and privately-owned HUD assisted housing. While the address matches apply only to 2011 or 2013, we carry the determination backwards to either 1985 or the first year in which the unit is part of the AHS sample, because the subsidies are applied to the units in these programs and the projects were constructed as fully assisted. We combined the match data with our own procedure for identifying assisted units for three reasons:

¹² The Hudson Institute File documentation explains how we made the assisted determination.

- The matches apply only to units that were assisted in 2011 or 2013. Some units were assisted earlier but no longer received assistance in 2011 or 2013 because they had graduated from the HUD program, because the owners had opted out of the HUD program, or because the units had left the housing stock.
- HUD and the Census Bureau acknowledge that the matches are incomplete, that is, some units receiving HUD assistance are overlooked.
- Approximately 400,000 units receive assistance from the Department of Agriculture's Rural Housing programs and are not included in the match.

Using both the matched address information and our multiple survey response procedure, we identified 3,121,000 units as assisted. The best estimates of assisted units show that HUD units peaked at 3.2 million in 2006;¹³ with the Rural Housing units this is roughly equal to our count of assisted units, taking into account that the 3.2 million estimate includes some programs not included in the match and other imperfections in the data.

Adjustment to median income: HUD publishes median incomes and income limits for its housing programs annually at the metropolitan area level and at the county level for non-metropolitan areas. In a small percentage of cases, HUD takes the regular income limits (50 percent of median or 80 percent of median) and adjusts them up or down to take into account unusual market conditions. For example, if HUD estimates that housing costs are unusually high in an area, it will raise the regular income limits to allow more households to qualify for assisted housing. HADS gives researchers the option to use affordability measures that have these adjustments built into them. We elected not to use this option because the adjustments would conflict with the purpose of our research. In definitions of affordability such as ours, higher incomes mean that more units qualify as affordable. Raising the income standard in a high cost area would make the area appear more affordable.

In 2007, HUD changed the methodology it used to set local median incomes, switching from updating the most recent decennial census to updating the most recent American Community Survey (ACS). In making this change, HUD observed that the income data from the ACS tended to be lower than the income data from the decennial census. Since we base our determinations of affordable on local median incomes, HUD's change in procedure threatened to introduce a discontinuity in our analysis. We used the data from the 2005 and 2007 AHS to make the 2007 and later local median incomes consistent with the 2005 and earlier local median incomes.¹⁴

Variation in bedroom counts: For almost half of our sample units (48.6 percent), respondents provided the same count of bedrooms in all the AHS surveys for which the

¹³ John C. Weicher, *Housing Policy at a Crossroads*, The AEI Press, Washington, D.C., 2012. See Table 4-5, pp. 114-115.

¹⁴ The Hudson Institute File documentation explains how we adjusted the 2007 and later local median incomes.

unit was part of the housing stock. This means the approximately half of the rental units that we studied had more than one count of the number of bedrooms. Since our determination of affordability is based on the reported number of bedrooms, this variation in counts may introduce some noise into our analysis. To see how serious this noise might be, we did an alternative analysis in which we limited the variation in bedroom counts.¹⁵ The Hudson Institute File contains both our restricted count of bedrooms and an alternative determination of unit status using the restricted count.

Additional issues in creating the Hudson Institute File: There are 15 separate public use files, one for each of the AHS surveys from 1985 through 2013. We had to eliminate a large number of cases found on one or more of these files. In addition to the mobile homes added in 2005, we had to eliminate the new cases added in 2011 to enhance the sample because we did not have any information on these units for all survey years. For similar reasons, we had to eliminate cases on the national file that were used to supplement metropolitan analyses in certain years, and the special rural oversample. There were some cases that were inexplicably dropped from some surveys. If the number of omissions were small, we could use our allocation procedure to keep the cases but sometimes the cases had to be eliminated. In 2011, the Census Bureau stopped keeping on the public use file information on what happened to cases that had become permanent losses for more than the year that they left the stock. Instead, the Census Bureau released a special file with information on these cases. A similar procedure is being implemented in 2013 except that the information on these cases is being incorporated into a yet-to-be-released “Where Did They Go (WDTG)” file with disposition information on all 129,000 plus cases that have appeared on the national files. We thank the Census Bureau for allowing us to use an early version of the WDTG file.

¹⁵ The Hudson Institute File documentation describes the restrictions we placed on the variation in bedroom counts.

Chapter 3. The National Affordable Rental Housing Stock: 1985-2013

We calculate the housing stock for the United States as about 100.9 million units in 1985 and about 132.8 million units in 2013, as explained in the discussion of weighting. This is an increase of 31.6 percent over the 28 years. It is important to keep the growth of the total stock in mind, when tracking the affordable rental stock, or any other component of the housing stock.

Of these units, 85.7 million were always in the stock from 1985 through 2013. About 15.2 million units were removed from the 1985 stock by 2013, while 52.8 million were added to the stock and an additional 1.0 million were units that were temporarily out of the housing stock in 1985 but in the stock as of 2013 – “reversible losses.” Of the 52.8 million added, 6.6 million were not in the housing inventory by 2013. “Removals” include both permanent losses, and temporary losses which may have come back into the inventory subsequently; over 90 percent of these losses are permanent.

These changes are summarized in Table 3-1 for the full 28 years and also for the period covered in our first report (1985-2005) and the additional period since then (2005-2013). Over the earlier period, the housing stock increased from 100.9 million units to 126.8 million, an increase of 25.6 percent. Of these units, 89.1 million units were in the stock in both years. About 11.8 million units were removed from the 1985 stock by 2005, while 41.6 million were added, and an additional 1.1 million were units that were temporarily out of the housing stock in 1985 but in the stock as of 2005. Of the 41.6 million added, 5.1 million were not in the stock as of 2005.

Over the later period, the housing stock increased from 126.8 million units to 132.8 million, an increase of 4.8 percent. Of these, 121.0 million were in the stock in both years. About 5.8 million units were removed from the 2005 stock by 2013, while 11.2 million units were added and an additional 1.1 million had been out of the housing stock in 2005 but in the stock as of 2013. Of the 5.8 million added, 0.5 million were not in the stock as of 2013.

There were sharp differences between the two periods. The annual average increase in the housing stock was about 1.1 percent from 1985 to 2005; it was about half as much (0.6 percent) from 2005 to 2013. Construction of new housing averaged between 1.3 and 1.4 million units per year in the earlier period, and between 1.0 and 1.1 in the later period. These differences should not be too surprising to anyone who experienced both the homeownership boom from about 1994 to 2005 and the Great Recession that started in 2007.

**Table 3-1. Total Stock and Changes in the Inventory:
1985-2013, 1985-2005, and 2005-2013**

Entire period: 1985-2013	1985	2013
Units in stock in both years	85,700,000	85,700,000
Units removed after 1985 by 2013	15,244,000	
Temporary loss in 2013	1,226,000	
Permanent loss	14,017,000	
Demolitions & disasters	6,752,000	
Other permanent losses	7,265,000	
Units added after 1985		52,810,000
New construction		35,471,000
Other additions		17,339,000
Temporary loss in 1985, in housing stock by 2013		958,000
Added after 1985, lost by 2013		-6,636,000
Temporary loss in 2013		-480,000
Permanent loss		-6,156,000
Total Stock	100,944,000	132,832,000
1985-2005	1985	2005
Units in stock in both years	89,108,000	89,108,000
Units removed after 1985 by 2005	11,835,000	
Temporary loss in 2005	1,618,000	
Permanent loss	10,217,000	
Demolitions & disasters	5,075,000	
Other permanent losses	5,142,000	
Units added after 1985		41,612,000
New construction		27,150,000
Other additions		14,462,000
Temporary loss in 1985, in housing stock by 2005		1,088,000
Added after 1985, lost by 2005		-5,058,000
Temporary loss in 2005		-912,000
Permanent loss		-4,146,000
Total Stock	100,944,000	126,751,000

2005-2013	2005	2013
Units in stock in both years	121,001,000	121,001,000
Units removed after 2005 by 2013	5,750,000	
Temporary loss in 2013	1,133,000	
Permanent loss	4,617,000	
Demolitions & disasters	2,180,000	
Other permanent losses	2,437,000	
Units added after 2005		11,198,000
New construction		8,321,000
Other additions		2,876,000
Temporary loss in 2005, in housing stock by 2013		1,149,000
Added after 2005, lost by 2013		-515,000
Temporary loss in 2013		-83,000
Permanent loss		-432,000
Total Stock	126,751,000	132,832,000

It is tempting to think of removals (especially permanent losses) as “demolitions” and additions as “new construction.” In fact, two-thirds of the “Units added after 1984” were new construction; but slightly more than half of the “Units removed after 1985” were not demolitions. This is approximately correct for each of the shorter periods as well as the full 28 years. Of the 14.0 million units that were permanent removals between 1985 and 2013, only 47.9 percent were “demolitions and disasters.” The share of demolitions was 49.7 percent between 1985 and 2005, and 42.7 percent between 2005 and 2013. The other permanent losses include actual losses from the stock such as the transformation of residential structures into non-residential buildings, or units lost through the conversion of one unit into multiple units. There are also cases that are not real losses to the stock, such as manufactured homes, and also a few houses, that are moved from one site to another.

Similarly, of the 52.8 million additions between 1985 and 2013, about 17.3 million (32.8 percent) were not new construction. The proportion was 35.2 percent from 1985 to 2005 and 25.7 percent from 2005 to 2013. These include other legitimate additions to the stock such as the transformation of non-residential structures into residential units, or new units created through the conversion of one unit into multiple units or the placement of new mobile homes on site, or old buildings that have been reconstructed, for example under federal historic preservation guidelines. Additions also include cases that are not real additions to the stock, such as manufactured homes and houses that are moved from one site to another – the converse of the cases that are not real losses. The AHS treats these moved-in units as “new” because it does not follow moved units from one location to another; instead it treats the moved-out unit as a loss and samples among moved-in units, on other sites, to replace the moved-out units. (For both additions and removals, we leave out units where the source or reason is not identified.)

The Status of Units in 1985 and in 2013

In order to analyze the affordable rental housing stock, we have developed a categorization system for the total housing stock, as explained in the previous chapter. Units are classified on the basis of tenure and, in the case of rental housing, affordability, and whether they are in the housing inventory for a particular survey. If they are not in the inventory, they are classified as temporary losses, permanent losses, or not yet added to the inventory.

Table 3-2 shows the number of units in these categories in 1985 and in 2013. These are simply the number of units in each category, in each year. The units in a particular category may or may not be the same units in both years.

Table 3-2. Status of Units in 1985, 2005, and 2013						
Status	1985		2005		2013	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not yet in stock	52,810,000		11,198,000		NA	
Affordable rental	14,971,000	14.8%	18,478,000	14.6%	19,702,000	14.8%
Moderate rental	13,371,000	13.2%	14,181,000	11.2%	16,376,000	12.3%
High rent	6,111,000	6.1%	5,389,000	4.3%	7,255,000	5.5%
Owned	60,173,000	59.6%	79,796,000	63.0%	78,111,000	58.8%
URE, etc.	6,319,000	6.3%	8,907,000	7.0%	11,388,000	8.6%
Temporary loss	1,819,000		2,907,000		1,970,000	
Permanent loss	NA		14,717,000		20,771,000	
Total Stock	100,944,000	100.0%	126,751,000	100.0%	132,832,000	100.0%
Total Rental Stock	34,453,000	34.1%	38,048,000	30.0%	43,333,000	32.6%

Affordable rental housing constituted about 14.8 percent of the total housing stock in both 1985 and 2013. It was not always 14.8 percent of the stock; in 2005, the share was 14.6 percent. Neither the reduction from 1985 to 2005 nor the increase from 2005 to 2013 is statistically significant.

However, the ratio of affordable rental housing to the total housing stock is the product of two other ratios, and the changes in both of them *were* significant:

$$\frac{\text{affordable rental housing}}{\text{total housing stock}} = \frac{\text{affordable rental housing}}{\text{all rental housing}} \times \frac{\text{all rental housing}}{\text{total housing stock}}$$

The share of rental housing that was affordable increased from 43.5 percent in 1985 to 45.5 percent in 2013. This is a substantial and statistically significant increase. To us, at least, it

is also a somewhat unexpected increase, particularly since it occurred during the Great Recession and the unusually weak recovery in the years immediately following. Household incomes were not increasing very rapidly during those years.

Over the same period, the share of the housing stock that was rental decreased from 34.1 percent to 32.6 percent. This is a substantial and statistically significant decrease. These two changes, in opposite directions, have offset each other.

Our samples are quite large, and it is therefore easy to exaggerate the importance of statistical significance tests, but for both of these ratios over all three time periods the t-statistic is at least 3.7 and as high as 13.6; and the changes are important as well as significant, in our judgment.

The *number* of affordable rental units increased substantially, from 15.0 million to 19.7 million, an increase of 31.6 percent. Affordable rental was the only rental category to maintain about the same share of the housing stock at the beginning and end of the period. Both the moderate and high rental categories declined by about two percentage points between 1985 and 2005, and subsequently increased by about one percentage point between 2005 and 2013. The total number of rental units increased by 8.9 million (25.8 percent) between 1985 and 2013. The changes were quite different for the two periods; the rental stock increased by 3.5 million during the 20 years from 1985 to 2005, and by 5.3 million during the eight years from 2005 to 2013.

The owned share of the housing stock increased from 60.2 million in 1985 to 79.8 million in 2005; then, most unusually, it declined to 78.1 million by 2013. The share of the stock rose sharply from 1985 to 2005 and declined even more sharply from 2005 to 2013. The most substantial change occurred for housing units that were not primary residences – second homes, vacation homes, usual residence elsewhere (URE), etc. – from 6.3 million units in 1985 to 8.9 million in 2005 and further to 11.4 million by 2013. The number of such units increased by 81 percent, and the URE share of the stock increased by 2.3 percentage points.

The shares of owned and rental housing in Table 3-2 do not match with the Census Bureau's homeownership rate, published quarterly in the H-111 series. This is because the Census Bureau excludes UREs from the calculation; the homeownership rate is simply (owner-occupied housing divided by the sum of owner-occupied housing and renter-occupied housing). In addition, the Census Bureau excludes vacant units, while we include vacant units for sale as "owned" and vacant units for rent as "rental," in the appropriate rental category. We want to know if rental units are affordable, whether or not they are occupied. The vacancy rate is always much higher for rental housing than for owned housing, so including vacant units results in a higher share of the stock being classified as rental. Finally, as mentioned in Chapter 2, we consistently underestimate the stock of rental housing. We have different weights from the Census Bureau, and we have excluded units that do not have usable data for all the years that they were in the survey.

Table 3-3. Homeownership Rates: AHS and Census

	1985	2005	2013
Owner-stock as share of housing stock (including UREs & seasonal)	59.6%	63.0%	58.8%
Owner-stock as share of housing stock (excluding UREs & seasonal)	63.6%	67.7%	64.3%
Owner-occupied as share of occupied stock (excluding UREs & seasonal)	65.6%	70.3%	66.3%
Census H-111	63.9%	68.9%	65.1%

The net effect of these various differences is that our homeownership rate is somewhat lower in all three years, as shown in Table 3-3; the top line is our calculated rate, the bottom is from the Census Bureau. The difference is largest in 2005, when the rental vacancy rate was highest (9.9 percent, compared to 6.5 percent in 1985 and 8.3 percent in 2013).¹⁶ Excluding both URE and vacant units, our calculated homeownership rate is consistently somewhat higher than the Census Bureau reports.

Changes in the Affordable Rental Stock, 1985-2013

Stability

While units need not be in the same category in 1985 and 2013, in fact a substantial number were. Table 3-4 shows that over two-thirds of the owned units in 1985 were also owned in 2013, with higher percentages for 1985-2005 and 2005-2013. The proportions for the individual rental categories are much smaller, simply because there are three rental categories and only one owned category. The number that were rental in both 1985 and 2013, regardless of affordability status, amounted to just over 30 percent of the 1985 rental stock, compared to almost 70 percent for the owned stock.

Over the shorter periods, the difference between owned and rental is smaller- not surprisingly, the shorter the period, the smaller the difference. The high rent category, as an example, has the smallest percentage in the same category for all three time periods, but while fewer than 20 percent of high rent units were in that category in 1985-2013 and also 1985-2005, close to half were in that category in both 2005 and 2013.

¹⁶ Calculated from U.S. Bureau of the Census, *Housing Vacancies and Homeownership*, "Annual Estimates of the Housing Inventory: 1965 to Present, Historical Table 7, available at <http://www.census.gov/hhes/www/housing/hvs/historic/files/histtab7.xls>. The vacancy rate for owned housing changed little (1.8 percent in 1985 vs. 1.9 percent in 2005).

Table 3-4. Housing Units in the Same Status at Period Endpoints		
Housing Units in the Same Status, 1985 and 2013		
Status	Frequency	Percent of 1985 Frequency
Affordable rental	6,243,000	41.7%
Moderate rental	4,039,000	30.2%
High rent	1,171,000	19.2%
Owned	41,302,000	68.6%
URE, etc.	1,894,000	30.0%
Rental	13,490,000	31.1%
Housing Units in the Same Status, 1985 and 2005		
Status	Frequency	Percent of 1985 Frequency
Affordable rental	7,006,000	46.8%
Moderate rental	4,391,000	32.8%
High rent	1,199,000	19.6%
Owned	46,356,000	77.0%
URE, etc.	2,056,000	32.5%
Rental	21,449,000	56.4%
Housing Units in the Same Status, 2005 and 2013		
Status	Frequency	Percent of 2005 Frequency
Affordable rental	10,973,000	59.4%
Moderate rental	7,414,000	52.3%
High rent	2,394,000	44.4%
Owned	65,186,000	81.7%
URE, etc.	4,067,000	45.7%
Rental	30,085,000	79.1%

Looking Forward

Among affordable rental units, fewer than half of those affordable in 1985 were also affordable in 2013. What happened to the rest of them?

Table 3-5 answers that question, reporting the 2013 status of units that provided affordable rental housing in 1985. Either they were no longer affordable (11.5 percent),

Table 3-5. Forward-Looking Analysis:		
What Happened to the 1985 Affordable Rental Stock by 2013?		
Status in 2013	Frequency	Percent of 1985 Affordable Rental Stock
Still affordable	6,243,000	41.7%
Gentrified	1,722,000	11.5%
Owner stock	1,884,000	12.6%
Seasonal or URE, etc.	791,000	5.3%
Temporary, reversible loss	276,000	1.8%
Permanent loss to housing stock	4,053,000	27.1%
TOTAL	14,971,000	100.0%
What Happened to the 1985 Affordable Rental Stock by 2005?		
Status in 2005	Frequency	Percent of 1985 Affordable Rental Stock
Still affordable	7,006,000	46.8%
Gentrified	1,713,000	11.4%
Owner stock	2,197,000	14.7%
Seasonal or URE, etc.	752,000	5.0%
Temporary, reversible loss	368,000	2.5%
Permanent loss to housing stock	2,935,000	19.6%
TOTAL	14,971,000	100.0%
What Happened to the 2005 Affordable Rental Stock by 2013?		
Status in 2005	Frequency	Percent of 2005 Affordable Rental Stock
Still affordable	10,973,000	59.4%
Gentrified	3,192,000	17.3%
Owner stock	1,841,000	10.0%
Seasonal or URE, etc.	1,037,000	5.6%
Temporary, reversible loss	248,000	1.3%
Permanent loss to housing stock	1,187,000	6.4%
TOTAL	18,478,000	100.0%

or they were no longer rental (17.9 percent, including both owned and URE), or they were no longer housing units (28.9 percent), either for the time being or permanently.

We have chosen to use the term “gentrified” to identify affordable units which were rental housing in both years, but in a higher rent category in the later year. Thus we include units which were affordable in 1985 and moderate rent in 2013, as well as units which were affordable in 1985 and high rent in 2013. In fact, 80 percent of these units were in the moderate rent category in 2013, and only 20 percent in the high rent category. (These data are not shown in Table 3-5.) Also, we are not including units which became owner-occupied, or for sale, in 2013; we count these separately, as units which changed tenure. There were more of these units than there were affordable units moving into higher rental categories.

Over 1985-2005, the pattern of changes is similar. Less than half were still affordable; 11.4 percent had gentrified; 19.7 percent were no longer rental; and 22.1 percent were no longer housing. Between 2005 and 2013, the pattern was quite different. Almost 60 percent were still affordable, and 17.3 percent had gentrified. Much smaller percentages were no longer rental (15.6 percent) or no longer housing (7.7 percent).

Looking Backward

Similarly, of the affordable rental units in 2013, about one-third had been affordable in 1985. Another 11.5 million units were added to the affordable rental housing by 2013. Where did they come from?

Table 3-6 reports the 1985 status of units that provided affordable rental housing in 2013. Most frequently, they were affordable rental housing in both years (31.7 percent). The additional units either filtered down from higher rent categories (23.4 percent), or they changed tenure from owner occupied or seasonal (21.8 percent), or they were not part of the housing stock in 1985 (23.0 percent). Most of the units in the last category were new construction, units built after 1984 (13.0 percent); the remainder were units that were temporarily out of the housing stock in 1985, or units added through mergers, conversions, reconstruction, or other means. These three broad categories were more or less equally important as sources of affordable rental housing in 2013.

Most of the higher-priced rental stock units that filtered down to become affordable by 2013 were moderate rental units in 1985 (85 percent). Only 15 percent filtered from high rent to affordable. Again, we are not including units which were owner-occupied or for sale in 1985 and affordable rental in 2013; these are counted as tenure shifts.

The pattern is similar for the period covered in our first report. Between 1985 and 2005. Most commonly, units were affordable in both years (37.9 percent). Otherwise, they filtered down from higher rent categories (24.1 percent), or they changed tenure (18.9 percent), or they were not part of the housing stock in 1985 (19.0 percent). The 1985 stock of rental housing was somewhat more important over this period than during 1985-2013; the other sources were less so.

For the 2005-2013 period, by far the most common source of affordable rental housing in 2013 was the affordable rental stock of 2005 (55.7 percent). Higher rent housing provided 19.0 percent; changes in tenure provided 20.2 percent; units that were not part of the stock in 2005 provided 5.1 percent. The collapse of the homeownership boom and the mortgage market may account for part of the tenure changes, but in general the changes are simply quite reasonable given the shorter time period.

Table 3-6. Backward-Looking Analysis:		
Where did the 2013 Affordable Rental Stock Come From, vis-a-vis 1985?		
Status in 1985	Frequency	Percentage of 2013 affordable rental stock
Affordable in 1985	6,243,000	31.7%
Filtered down	4,615,000	23.4%
From owner stock	3,845,000	19.5%
From seasonal/URE stock	463,000	2.3%
Temporarily out of housing stock in 1985	200,000	1.0%
Additions to stock	4,337,000	22.0%
New construction	2,557,000	13.0%
Other additions	1,780,000	9.0%
TOTAL	19,702,000	100.0%
Where did the 2005 Affordable Rental Stock Come From, vis-a-vis 1985?		
Status in 1985	Frequency	Percentage of 2005 affordable rental stock
Affordable in 1985	7,006,000	37.9%
Filtered down	4,458,000	24.1%
From owner stock	2,974,000	16.1%
From seasonal/URE stock	517,000	2.8%
Temporarily out of housing stock in 1985	265,000	1.4%
Additions to stock	3,259,000	17.6%
New construction	1,839,000	10.0%
Other additions	1,420,000	7.7%
TOTAL	18,478,000	100.0%
Where did the 2013 Affordable Rental Stock Come From, vis-a-vis 2005?		
Status in 2005	Frequency	Percentage of 2013 affordable rental stock
Affordable in 2005	10,973,000	55.7%
Filtered down	3,750,000	19.0%
From owner stock	3,317,000	16.8%
From seasonal/URE stock	668,000	3.4%
Temporarily out of housing stock in 2005	174,000	0.9%
Additions to stock	820,000	4.2%
New construction	466,000	2.4%
Other additions	354,000	1.8%
TOTAL	19,702,000	100.0%

Looking Both Ways

Thus the most common reason for losses from the affordable rental stock between 1985 and 2013 was that the unit was no longer providing housing; it was permanently lost. Over the same period, the most common source of additional affordable rental housing was the higher-rent stock. The same statements are true for the 1985-2005 period of our first report.

Table 3-7 puts the gains and losses together to account for the increase in the number of affordable rental units. Of the additional 4.7 million units, only 0.2 million came from net additions to the housing stock; there were almost as many losses as new units. The other 4.5 million came as a result of changes within the 1985 existing housing stock – 2.9 million from changes in the rent levels of the 1985 rental stock, and 1.6 million from tenure shifts between owned or URE units and rental housing. The net increase from filtering is almost twice as important as the net increase from tenure shifts, and far more important than the net increase from new construction and demolitions (and other sources of additions or removals). The gross increases are very similar – 4.6 million from filtering, 4.5 million from new construction and other additions, 4.3 million from the non-rental housing – but fewer units are lost from gentrification than from tenure shifts, and far fewer than from demolitions and other losses.

Table 3-7. Accounting for the Change			
	1985-2013	1985-2005	2005-2013
Beginning year affordable rental stock	14,971,000	14,971,000	18,478,000
New construction/Other additions	4,537,000	3,524,000	994,000
Demolitions/Other losses	4,330,000	3,303,000	1,435,000
NET EFFECT	207,000	222,000	-440,000
Filtering-becoming affordable	4,615,000	4,458,000	3,750,000
Gentrifying - rising rents	1,722,000	1,713,000	3,192,000
NET EFFECT	2,892,000	2,744,000	558,000
Tenure shift - owned or URE/seasonal to affordable rental	4,307,000	3,490,000	3,985,000
Tenure shift - affordable rental to owned or URE/seasonal	2,675,000	2,949,000	2,878,000
NET EFFECT	1,632,000	542,000	1,107,000
NET ADDITION	4,732,000	3,507,000	1,224,000
End year affordable rental stock	19,702,000	18,478,000	19,702,000

The pattern for 1985-2005 is quite similar to the pattern for 1985-2013, with the exception that there are almost a million fewer tenure shifts from owned or URE units between

1985 and 2005 than from 1985 to 2013. This is consistent with the homeownership boom of 1994-2005 and the home mortgage market collapse after 2007. The collapse also explains much of the difference between the 2005-2013 period and the earlier one. The homeownership rate dropped sharply beginning in 2005, and indeed is still continuing to decline; many of those units are now providing rental housing, and apparently quite a few are providing affordable rental housing.

The Process of Change

The preceding discussion concerns only the beginning and ending status of housing units. From that basic tabulation, it is clear that the status of many housing units changed over the 15 surveys. Except for the single category of owned housing, fewer than half the units in any category in 1985 were in the same category in 2013. Clearly, there was a great deal of change in the housing stock over those years.

Always Affordable

At the same time, however, there were a substantial number of units that remained in the same category throughout the period. Table 3-8 shows the number of units that were “always affordable” or always in one of the other categories. Almost half of the units that were affordable rental units in both 1985 and 2013 – some 3.2 million units out of the 6.2 million shown in Table 3-6 – were affordable in each of the surveys between those years. This is far more than were always moderate rental or high rent.

Looking forward from the 1985 stock, slightly more than 20 percent of the units that were affordable rental in 1985 remained in that status for the next 28 years (3.2 million out of 15.0 million). Very few of the 1985 moderate rental or high rent units kept the same status throughout the period: 360,000 moderate rentals of the 13.4 million that were in the stock in 1985, 100,000 high-rent units out of 6.1 million high-rent units in 1985.

A major reason for this difference between affordable rental housing and the two higher categories is that 2.7 million of the always affordable units were assisted, and are therefore treated as always affordable. Among those that are not assisted, 524,000 out of 11.9 million were always affordable. This is only a slightly larger percentage than for moderate or high rent units, none of which are assisted.

In addition to the units that were always affordable from 1985 to 2013, there were also 827,000 units that entered the stock after 1985 and were affordable in every succeeding survey. Thus a total of 4.0 million units were always affordable rental, for as long as they were in the survey. This figure can be given undue importance; units added to the sample in the 2013 survey are by definition “always” in whatever status they had in that year. In our first report, we noted that about 240,000 units entered the stock in 2005 as affordable, and another 206,000 entered the stock in 2001 or 2003. By 2013, about 90,000 of the units that entered the stock as affordable 2005 remained affordable through 2013, and about 110,000 of those that entered the stock as affordable in 2001 or 2003 were always affordable through 2013. Of the 827,000 units that

entered the stock during 1987-2005, about 490,000 remained affordable through 2013, as shown in Table 3-2.

Something similar may well happen with the 80,000 units that entered the stock as affordable in 2013, and the 161,000 that entered the stock as affordable in 2009 or 2011. Over 40 percent of the units that entered the stock as affordable and remained affordable through 2013 entered the stock in 2007 or later.

Table 3-8a. Number of Units Always in the Same Status, 1985-2013			
	always, 15 surveys	always, <15	Total
affordable rental	3,196,000	827,000	4,023,000
Private affordable	524,000	548,000	1,073,000
Assisted	2,671,000	279,000	2,951,000
moderate rental	358,000	749,000	1,107,000
high rent	95,000	465,000	560,000
Owned	28,222,000	22,059,000	50,282,000
seasonal/URE	684,000	940,000	1,625,000
Total	35,752,000	25,869,000	61,620,000
Always rental	12,588,000	5,642,000	18,230,000
Always rental or always owned or always seasonal	41,495,000	28,641,000	70,137,000

Table 3-8b. Percentage of Units Always in the Same Status		
	Always for all 15/ 1985 stock	Always, total/2013 stock
affordable rental	21.3%	20.4%
Private affordable	4.4%	6.5%
Assisted	84.7%	93.9%
moderate rental	2.7%	6.8%
high rent	1.6%	7.7%
Owned	46.9%	64.4%
seasonal/URE	10.8%	25.7%
Always rental	36.5%	42.1%
Always rental or always owned or always seasonal	41.1%	52.8%

For the high rent category, the pattern is more extreme. Of the 6.1 million high rent units in 1985, only 95,000 (fewer than two percent) remained high rent throughout the period. Looking backward, there were 7.2 million high rent units in 2013, of which fewer than two percent were high rent throughout the period. Another 465,000 were added to the stock as high

rent units after 1985 and remained in that status until 2005. But about 231,000 of these 465,000 were added to the survey in 2011 or 2013. These very recent additions accounted for over 40 percent of the units that were “always high rent,” but only slightly more than three percent of the high rent units in the 2013 inventory.

Table 3-8a reports the number of units that were always rental, or always owned, or always seasonal/URE. In Table 3-2, we reported the number of units that were in the inventory in 1985 for these tenure categories. For rental housing, there were 12.6 million that were always rental from 1985 through 2013 – 36.5 percent of the 34.5 million that were rental in 1985. The corresponding shares were 46.9 percent for the owned stock and 10.8 percent for the seasonal/URE stock.¹⁷ Altogether, 41.5 million units were always in the same tenure category throughout the years from 1985 to 2013 – 48.4 percent of the 85.7 million units which were in the stock throughout the entire 1985-2013 period, as reported in Table 3-1. Similarly, 52.8 percent of the units in the 2013 inventory were in the same status in every survey (either since 1985 or since they entered the housing stock) – 70.1 million out of 132.8 million; and 54.2 percent of the units added after 1985 were in the same status once they entered the stock – 28.6 million out of 52.8 million. Almost half of all housing units remained in the same tenure, even after almost three decades; more than half of those that were in the stock for shorter periods

Many rental units moved between affordability categories while remaining rental. Whether the same is true for owned units (or for that matter, URE units) lies outside the scope of this study.

“Blips”

Besides the 3.2 million units which were always affordable, there were 3.0 million which were affordable in 1985 and 2013, but not in all the surveys between those years. The paths followed by these units merit attention.

A substantial share – about 0.9 million – were affordable in every year but one. Somewhere between 1987 and 2011, they were not affordable rental housing; they were something else. Most commonly, these “blips” are moderate rental housing, as Table 3-9 shows. Units which were affordable 14 times and moderate once amount to over 250,000, almost half of all blips (47.7 percent). Blips to URE are about 100,000; blips to “temporary loss” about 87,000, which would include units that are being renovated.

We investigated the possibility that blips to moderate rental might be artifacts of the data. It seemed plausible that rents might rise markedly faster than incomes in a particular biennium, with incomes catching up subsequently. We found no pattern supporting that reasonable conjecture, however. Blips are fairly well spread across the 13 surveys between 1987 and 2011 inclusive.

¹⁷ If any sample units had been reported as temporary or reversible losses in all 15 surveys, we would have dropped them from the sample as never having being part of the housing stock.

Table 3-9. “Blips”

Affordable in 1985 & 2013	6,243,000	100.0%
Always affordable	3,196,000	51.2%
Affordable but one blip to moderate	262,000	4.2%
Affordable but one blip to high	34,000	0.5%
Affordable but one blip to owner	66,000	1.1%
Affordable but one blip to seasonal/URE	100,000	1.6%
Affordable but one blip to temp loss	87,000	1.4%
All with one blip	549,000	8.8%
Always either affordable or moderate		
Affordable but one blip to moderate	262,000	4.2%
Affordable, two non-consecutive blips to moderate	121,000	1.9%
Always either affordable or moderate, other paths	532,000	8.5%
Total: always either affordable or moderate (at least one moderate)	915,000	14.7%
Other blips -- <u>single blip only</u>	287,000	4.6%
Total: blips plus always affordable or moderate	4,398,000	70.4%
<u>Units following</u> other paths	1,845,000	29.6%

Since blips to moderate accounted for almost half of all blips, we looked at other paths consisting of only affordable and moderate rental. About 65,000 units were moderate rental in two consecutive surveys and affordable in all of the other 13, and about 120,000 units experienced two, non-consecutive blips to moderate rental; for about 30,000 of these units, the blips occurred with just one survey in between. Another 530,000 following other paths. In total, over 900,000 units were affordable in both 1985 and 2013, and either affordable or moderate in each of the intervening surveys.

Altogether, blips and units that were always either affordable or moderate add up to 1.2 million units. They account a substantial share of the 3.0 million units that were affordable at the beginning and end of the period, but not always in between. The remaining 1.8 million units took a wide variety of paths, not easily summarized.

Filtering and Gentrification

It is also instructive to examine the paths taken by the units which filtered or gentrified. As reported in Tables 3-5 and 3-6, about 4.6 million units filtered down from the higher-rent categories in 1985 to become affordable by 2013, and about 1.7 million affordable units in 1985 moved up to the higher-rent categories by 2013.

Of the 4.6 million units that filtered, 622,000 filtered monotonically. From one survey to the next, they were either in the same affordability category, or a lower one. Once they were affordable, they remained affordable until 2013. They constitute somewhat more than 13 percent of the units which were moderate rental or high-rent in 1985 and affordable in 2013. As mentioned earlier, most of the 4.6 million units that filtered – 85 percent – started as moderate rental rather than high-rent. This holds for the subset that filtered monotonically; about 546,000, or 88 percent, were moderate rental in 1985.

In addition to the 622,000 units that were in the 1985 housing stock and filtered monotonically, another 497,000 were added to the stock after 1985 as moderate or high-rent units, and then filtered monotonically to become affordable by 2013. Of these 497,000, 80 percent entered the inventory as moderate rentals. Slightly less than half (43%) of the 497,000 were in the inventory for most of the period, being added to the stock in 1999 or earlier – 178,000 of them filtered from moderate to affordable, less than 36,000 from high-rent to affordable.

Gentrification shows a corresponding pattern. Of the 1.7 million affordable units in 1985 that moved to higher-rent categories by 2013, about 145,000 gentrified monotonically; of these, almost 107,000, 74 percent, moved from affordable to moderate rent. In addition, another 261,000 entered the inventory after 1985 as affordable, and gentrified monotonically; of these, almost 150,000, 78 percent, moved to moderate rental.

These data suggest that filtering and gentrification occur within a fairly narrow range of rents. At least for those units which filtered or gentrified monotonically, most moved only between affordable and moderate rent status. It needs to be kept in mind, however, that the large majority of units that start as moderate rental and finish as affordable, do not filter monotonically. In the intervening years, they may be in any status, for any number of years up to 26. A second possibility is that even a period as long as 28 years may not be long enough to observe the complete filtering process. The units which were moderate rental in 1985 and affordable in 2013 may have been high-rent before 1985; the units which were high-rent in 1985 and moderate rental in 2013 may have continued to filter down to affordable after 2013.

Assisted Housing

Most if not all assisted housing is affordable housing, and most assisted housing projects, both public and privately-owned, were built before 1985. The AHS asks respondents whether they are receiving housing assistance and, if so, what form of assistance. It is therefore worth

investigating what has happened to the assisted housing stock between 1985 and 2013. This investigation is particularly relevant to understanding the federal, local, and private efforts to preserve privately-owned assisted housing projects, efforts which began in 1987 and are still continuing.

Measuring Assisted Housing in the AHS

Unfortunately, for most of its existence, the AHS has not been a satisfactory source of data on assisted housing. It has traditionally relied on household responses to questions about the receipt of housing assistance. Many more households have reported receiving housing assistance in the AHS than are actually being assisted, according to HUD program data. The problems with the AHS in this regard have been recognized for many years. HUD's efforts to address them have included several revisions of the questionnaire, most recently in 1997.¹⁸ HUD and the Census Bureau have also worked to reconcile the two sources by matching the addresses of units surveyed in the AHS with the addresses for housing units whose residents are receiving assistance, according to HUD program records. These matches have been developed and published for the years 1989, 1991 and 1993, and then again for 2003.¹⁹ These matching efforts have made it clear that the differences between the AHS and HUD's program data are substantial, despite the efforts to identify assisted units more precisely in the AHS. In 2003, 3.3 million renter households received housing assistance, according to both the AHS and HUD program data. Another 1.0 million received assistance according to the HUD program data but not the AHS; and a further 3.8 million reported that they received assistance to the AHS but are not shown as receiving assistance in the HUD data.²⁰

A further problem is that many households – 1.4 million of the 3.3 million - report that they receive assistance from one program, while the HUD program data indicate that they receive assistance from a different program. Another 500,000 do not specify the program that provides their assistance. This situation occurs even in public housing, where the AHS question is quite direct. There were 944,000 public housing units, according to both sources; there are another 150,000 public housing units according to HUD but not the AHS, and another 1.159 million public housing units according to the AHS but not HUD. For the privately-owned projects – Section 8, Section 236, and smaller programs – the discrepancies were even larger. Some 416,000 households responded in the AHS that they were receiving a government subsidy (not public housing, or a voucher), and they were also found in HUD program data for the privately-owned projects; but 969,000 households were receiving project-based assistance according to the HUD data but not the AHS, and 1.313 million reported receiving project-based

¹⁸ The 1997 revisions are described in U.S. Department of Housing and Urban Development, *Rental Housing Assistance – The Worsening Crisis: A Report to Congress on Worst Case Housing Needs* (March 2000), pp. A-22 to A-25; and ICF, Inc., “Documentation of Changes in the 1997 American Housing Survey,” (July 2001), p. 43, at <http://www.huduser.org/portal/datasets/ahs/docchg1997.pdf>.

¹⁹ U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Characteristics of HUD-Assisted Renters and Their Units in 2003*, May 2008.

²⁰ *Ibid.*, p. 52. These figures are taken from the table using weights for the AHS developed for the report, not those in the published AHS. Our weights in this study are derived from the latter.

assistance in the AHS but were not found in the HUD program data. Thus, HUD program data identified 2.5 million assisted units, while the AHS identified 3.7 million assisted units.

In our first report, we looked at the *consistency* with which respondents answered the questions about assistance. If the preponderance of the answers were “assisted,” and the units had the characteristics of HUD-assisted units, primarily tenure, structure type and year built, we classified the units as assisted and counted them as affordable. We considered this to be the best available method of identifying households in assisted housing projects, but it left us with an undercount of assisted households who received assistance that was tied to the units – the opposite outcome to the overcount from the household responses.

Since our first report, HUD and the Census Bureau have begun to identify units in the AHS that are assisted by HUD, and to report these units as assisted in the public use files for 2011 and 2013. In Chapter 2, we explained how we combined our response-based approach with the matched data from the Census Bureau and HUD to determine whether units are assisted or not.

It is worth keeping in mind that the match by itself is not sufficient to identify all units that received project-based assistance in the AHS, for a variety of reasons.

- Some households are receiving assistance through the Section 515 rural housing program, which is managed and funded by the Rural Housing Service of the U.S. Department of Agriculture. These units do not appear in the HUD budget numbers, but they certainly could be, and should be, included in the AHS, and reported as affordable housing. There were 434,000 Section 515 units in 2003; they could account for as much as one-third of the units in privately-owned projects reported in the AHS but not found in the HUD program data.²¹
- Some HUD-assisted units left the housing stock prior to 2011. HUD budget data indicate that the highest number of units receiving project-based assistance was 3,234,000 units, in 1995. By 2009, the number of such units was down to 2,619,000.²² The 585,000 units that were either no longer in the housing stock or no longer receiving assistance could have been part of the AHS sample.
- There may be some HUD-assisted units in the sample that were not matched, because of inconsistent addresses. We have no information about the number of these units.
- Some units may be receiving assistance in other ways not captured in the HUD data, for example through the Low Income Housing Tax Credit.

²¹ ICF Consulting, “Rural Rental Housing – Comprehensive Property Assessment and Portfolio Analysis: Final Study Report” (November 2004), p. 11, at http://www.icfi.com/Markets/Community_Development/doc_files/rural-rental-housing.pdf.

²² See John C. Weicher, “Housing Policy at a Crossroads: The Why, How, and Who of Assistance Programs,” (Washington, DC: AEI Press, 2012) Table 4-5, and the sources there cited.

We are interested in the role of assistance that is tied to units for several important public policy concerns: the contribution of these publicly assisted units to affordable housing; the continuing discussions about the permanence of housing assistance that is tied to units, as opposed to housing vouchers; and the changing role of assistance tied to units since most of the programs that have provided project-based assistance have been discontinued, and are no longer providing assistance for new projects (exceptions include Section 202 for the elderly and Section 811 for persons with disabilities). The first of these issues is the primary focus of our research, but in addition we believe that our results are relevant to the other issues as well.

The Stock of Assisted Affordable Rental Housing

The number of rental units that are identified as assisted and affordable by the combination of our approach and the HUD/AHS match in each of the 15 surveys is shown in Table 3-10. There were approximately 3.2 million assisted affordable units throughout the period between 1985 and 2013. The highest number is 3,219,000 in 1991; the lowest is 3,141,000 in 2013. On average, there were 3,184,000 assisted affordable units over the 30-year period. There is a slight, statistically insignificant decline in the number of assisted affordable units over the 15 surveys, not surprising given that the number of units generally rose from 1985 through 1995, then declined to 2013 with the exception of an increase in 2005.

Not all of these assisted units were in the housing stock in all 15 surveys. About 2.7 million were – about 85 percent of the average number of assisted rentals in Table 3-11. We also calculate that some 280,000 were added to the stock after 1985. In addition, some units were temporarily out of the stock, and some had permanently left the stock before 2013.

These units accounted for 21 percent of the affordable rental stock in 1985 and continued to provide an important share from 1985 through 2013. But, as the affordable rental stock increased concomitantly with the total housing stock – as shown in Table 3-2, the affordable rental share of the housing stock was 14.8 percent at the beginning and end of the period – the share of assisted housing in the affordable rental stock declined to 16 percent.

None of these calculations should be interpreted to mean that the assisted stock was unimportant. In Table 3-8a, we reported that there were 3,196,000 rental units that were always affordable in all 15 surveys, and 827,000 that were always affordable but were part of the stock in fewer than 15 surveys, for a total of 4,023,000 always affordable. Assisted units comprise the 2.7 million that were assisted in all 15 surveys, and the 280,000 that were always assisted but entered the stock after 1985. These always assisted units constitute 74 percent of the units that were always affordable when they were in the housing stock. The assisted stock greatly affects the perceived stability of the always affordable stock.

Table 3-10:
The Importance of Assistance Tied to Units in Affordable Rental Housing

Survey	Affordable Rentals	Unassisted Affordable	Assisted Rentals	Percent Assisted
1985	14,971,000	11,816,000	3,154,000	21.1%
1987	15,750,000	12,540,000	3,210,000	20.4%
1989	16,888,000	13,681,000	3,207,000	19.0%
1991	17,735,000	14,516,000	3,219,000	18.1%
1993	17,953,000	14,738,000	3,215,000	17.9%
1995	16,685,000	13,477,000	3,208,000	19.2%
1997	17,561,000	14,347,000	3,214,000	18.3%
1999	17,528,000	14,343,000	3,184,000	18.2%
2001	17,535,000	14,367,000	3,169,000	18.1%
2003	19,017,000	15,850,000	3,167,000	16.7%
2005	18,478,000	15,281,000	3,197,000	17.3%
2007	18,833,000	15,647,000	3,187,000	16.9%
2009	19,501,000	16,349,000	3,152,000	16.2%
2011	19,689,000	16,547,000	3,142,000	16.0%
2013	19,702,000	16,561,000	3,141,000	15.9%

Vouchers, Assisted Housing, Public Housing, and the Affordable Rental Stock

While vouchers are not a direct focus of our study, as mentioned above, they also play a major role in helping households obtain decent housing. The voucher has grown steadily from about 800,000 households in 1985 to about 2.4 million in 2013. Every voucher household benefits from being able to pay a reduced rent. But, from our perspective in this study, vouchers increase affordable rental housing to the extent that households use them to rent moderate or high rent units. We were able to examine this effect only for 2011 and 2013. In those years, 20 to 25 percent of voucher households – about 500,000 to 600,000 households – rented moderate or high rent units.

Including assisted housing in the affordable housing stock did not increase the count of affordable rentals by 3 million housing units. Most of the assisted units would have been counted as affordable by our original rule. Including assisted units increased the count of affordable units by 5.9 percent in 1985, declining to 2.8 percent in 2013.

Finally, despite the stereotype of rundown public housing, the analysis in the last section of this chapter shows that assisted housing was better in quality than unassisted affordable rentals, at the beginning of our study period. However, the difference in quality declined throughout the period and had virtually disappeared by 2013. This parity does *not* mean that public housing was physically inadequate; in general, it means the opposite.

Changes During the Decades

Besides analyzing the changes between 1985 and 2013, we have divided the full period into three subperiods, taking advantage of the coincidence that there have been three distinct periods in the housing market during these years, each lasting about a decade. From 1985 to 1995 the housing market was more or less “normal,” particularly relative to what has happened since; from 1995 to 2005 there was a “homeownership boom;” from 2005 to 2013 the housing market went through a period that that brought back memories of the 1930s. In this section, we split the full 28 years into these three subperiods, and compare the differences by “decade,” roughly speaking. This is interesting for several reasons. Most broadly, it provides some insight into the relationships between shorter-term and longer-term changes in the housing stock. Also, it permits us to look at changes during very different economic situations. . Finally, other analysts have reported on rental housing during the 1995-2005 decade, and comparisons between the results provide some information about differences in approach and a check on the validity of each study

There are substantial differences between the decades. Between 1985 and 1994, the housing stock increased by 14 percent, split nearly evenly between owned and rental housing. The homeownership rate (as calculated by the Census, limited to occupied units), fluctuated in a narrow range, finishing almost exactly where it was nine years earlier (63.9 percent in 1985, 64.0 percent in 1994). Beginning in 1994 and continuing until about 2004 or 2005, there was a “homeownership boom.” The national homeownership rate rose from 64.0 percent in 1994 to 69.0 in 2004; it declined slightly to 68.9 percent in 2005. This is an unprecedented increase for any decade since the end of World War II. Moreover, not only did the rental *percentage* of occupied housing units decline, so did the absolute *number*. There were 2.5 million fewer renter-occupied units in 2004 than there had been in 1994 – 35.6 million compared to 33.0 million. This has probably never occurred in the United States.²³ The rental vacancy rate increased from 7.7 percent of the rental stock to 9.9 percent, a strong indication that the market was being driven by what happened to owned housing. The housing market peaked between 2004 and 2006, before beginning a precipitous decline. The number of renters increased by seven million between 2004 and 2013, and the homeownership rate dropped from 69.0 percent to 65.1 percent by 2013. Since 2013, the homeownership rate has continued to drop, to 63.7 percent in 2015, and the number of renters has continued to rise, from 42.0 million to 42.6 million in 2015. The rental vacancy rate has remained high by historical standards, but it did decline to 8.4 percent by 2013.²⁴ It is worthwhile to investigate what happened to the affordable rental housing stock during this highly unusual period.

²³ U.S. Bureau of the Census, “Housing Vacancy Survey: - Historical Table 7: Housing Vacancies and Homeownership,” at <http://www.census.gov/hhes/www/housing/hvs/historic/files/histtab7.xls>.

²⁴ U.S. Bureau of the Census, “Housing Vacancies and Homeownership (CPS/HVS), Annual Statistics: 1995, Table 2, at <http://www.census.gov/hhes/www/housing/hvs/annual95/ann95t2.html>, and U.S. Bureau of the Census, “Housing Vacancies and Homeownership (CPS/HVS), Annual Statistics: 2005, Table 2, at <http://www.census.gov/hhes/www/housing/hvs/annual05/ann05ind.html>.

We are necessarily limited to odd-numbered years in our analysis. Table 3-11 shows the changes during the decades 1985-1995 and 1995-2005, and then during the severe economic downturn and unusually weak recovery from 2005 to 2013. (The U.S. economy peaked in December 2007, as reported by the National Bureau of Economic Research, but the housing market had peaked a year or two before, as described in the preceding paragraph.)

As discussed earlier in this chapter, the affordable rental housing stock changed remarkably little amidst the housing market chaos. As shown in Table 3-11, it increased by about 1.7 million units in each of the first two decades, and then by an additional 1.2 million since 2005. It constituted 14.8 percent of the total stock in 1985, and 14.8 percent of the total stock in 2013. In between those dates, it declined by 0.1 percent between 1985 and 1995, and another 0.1 percent between 1995 and 2005. The affordable rental share of the rental housing stock increased, while the rental share of the total housing stock decreased, and these substantial changes almost perfectly offset each other.

Table 3-11. Housing Stock by Decade								
	1985	1995	2005	2013	1985-1995	1995-2005	2005-2013	1985-2005
Housing stock	100,944,000	113,504,000	126,751,000	132,832,000	12,560,000	13,247,000	6,081,000	31,888,000
Affordable rental	14,971,000	16,685,000	18,478,000	19,702,000	1,714,000	1,793,000	1,224,000	4,732,000
Percent of stock	14.8%	14.7%	14.6%	14.8%				
Percent growth:								
total stock					12.4%	11.7%	4.8%	31.6%
affordable rental					11.4%	10.7%	6.6%	31.6%

Table 3-12 takes a closer look at the changes in the affordable rental stock between 1985 and 2013, and presents a more complicated picture from one decade to the next. More than half the affordable rental stock at the beginning of each period was affordable at the end, unlike the full 28-year period. Of the 8.6 million that were affordable in 1995, 6.2 million were affordable 18 years later. These are not necessarily “always affordable:” they were affordable in the first and last year, but may not have been in all the intervening years. In each period, filtering accounted for more than 100 percent of the net change; over the full 30 years, filtering account for just less than 100 percent of the total. Filtering net of gentrification accounted for almost three-quarters of the net change during 1985-1995, more than the net change during 1995-2005, and a little less than half of the net change between 2005 and 2013. Over the full 30 years, filtering net of gentrification accounted for two-thirds of the net change. Shifts in tenure accounted for over one-third of the net change during 1985-1995; but in the next decade, tenure shifts *out of* the affordable rental stock exceeded tenure shifts *into* affordable rental status. This is consistent with the growth in homeownership during that decade; units as well as households shifted from renting to owning. Then, between 2005 and 2013, tenure shifts accounted for over 80 percent of the increases in the affordable rental stock. The net change in the total housing stock - new additions minus permanent losses - had the least effect on the affordable rental stock, accounting for less than 300,000 of the 4.7 million net increase. Additions exceeded losses during the first period; losses exceeded additions in each of the later periods.

Table 3-12. Tracking Changes in Affordable Rental Housing by Decade, 1985-2013

	1985-1995	1995-2005	2005-2013	1985-2013
Affordable in base year	14,971,000	16,685,000	18,478,000	14,971,000
Still affordable in end year	8,582,000	9,048,000	10,973,000	6,243,000
New additions	1,569,000	1,429,000	820,000	4,337,000
Permanent losses	1,354,000	1,622,000	1,187,000	4,053,000
Net change	214,000	-193,000	-367,000	284,000
Filtered down	3,464,000	4,593,000	3,750,000	4,615,000
Gentrified	2,173,000	2,326,000	3,192,000	1,722,000
Net change	1,291,000	2,267,000	558,000	2,892,000
From owner & URE	2,888,000	3,116,000	3,985,000	4,307,000
To owner & URE	2,244,000	3,391,000	2,878,000	2,675,000
Net change	644,000	-275,000	1,107,000	1,632,000
Temporary loss in base year	182,000	292,000	174,000	200,000
Temporary loss in end year	617,000	297,000	248,000	276,000
Net change	-435,000	-5,000	-74,000	-77,000
Affordable in future year	16,685,000	18,478,000	19,702,000	19,702,000
Change	1,714,000	1,793,000	1,224,000	4,732,000

In reading Table 3-12, it is important to remember that the changes during each period do not necessarily – indeed, should not be expected to – add to the total for the 30 years. Some of the units which filtered from 1985 to 1995 dropped out of the stock or moved back into higher rent categories, or shifted to owned housing or second homes, for example. Some of the units which filtered after 1995 were not moderate rental or high-rent in 1985, and indeed may not have been in the inventory at all. Similarly, some units may have switched tenure during each period. Some new additions during 1985-1995 may not have been affordable rental by 1995 or 2005, but became affordable rental by 2013.²⁵

²⁵ As Table 3-12 indicates, in 2013 there were 19.7 million rental units affordable to very low income renter households; at the same time, there were 18.3 million very low income renter households, of which 4.9 million were assisted by either HUD or the Rural Housing Service. These numbers differ from those in HUD's most recent "Worst Case Needs" report, which indicates that there were 18.0 million affordable rental units in 2013 and 18.5 million very low income renter households. There are several reasons for the differences. The most important is that the Worst Case Needs report uses the published HUD median income numbers that are based on data from the American Community Survey beginning in 2007, whereas we splice the ACS-based data to the pre-2007 income data calculated updated from the most recent decennial census. We also have different weights and therefore different counts of the renter population because we are constructing weights for the entire 1985-2013 period, and different samples, because the Worst Case Needs report include the cases added in 2011 to expand the sample, while we exclude them because we have no history for these units before 2011.

The Characteristics of Affordable Rental Housing, 1985-2013

Turning from the quantitative to the qualitative, this chapter describes the characteristics of the affordable rental stock. We compare the 1985 and 2013 stocks to see how affordable rental housing has changed, and also we compare the affordable rental stock with higher-rent housing, in both 1985 and 2013. These data are shown in Table 3-13. We first look at structural characteristics, then at location.

The data for structure type are the most surprising. Affordable rental housing is and has been predominantly in small structures. Two-thirds of the 1985 stock was in single-unit structures (including mobile homes) or very small apartment buildings, those with two to four units. The share declined from 67 percent to 60 percent by 2013, which is statistically significant, but units in small structures still constitute a substantial majority of the affordable rental stock. The decline in single-family detached houses, from 32 percent to 28 percent, accounts for half of the decline.

The increases in the three multifamily categories consisting of structures with 5 to 49 units were all significant; the increase in the largest size category was not. Small structures also accounted for more of the affordable rental stock than the higher-rent categories: 56 percent of moderate rentals and 52 percent of high-rent units in 1985, 57 percent of moderate rentals and 53 percent of high-rent units in 2013.

Affordable rental housing was older than the stock in the other categories in both years, but not perhaps by as much as might be expected. The median year built in 1985 was 1957, about five years earlier than for moderate rental units, and 13 years earlier than high-rent units.²⁶ By 2013, there was still a five-year difference between affordable and moderate rental housing, while the difference from high rent housing was five years smaller for both. There were declines in the percent of affordable rental housing provided by each of the cohorts before 1960, and increases for each later cohort. This may reflect the homeownership boom that began in 1994. It may also reflect the changes in the tax benefits of rental housing in 1986, after which rental housing production gradually but substantially declined. (Multifamily housing starts were higher in 1985, at 577,000, than in any other year during our period; starts declined steadily to 153,000 in 1993 and have never been above 334,000 since then. In the 15 years before the Tax Reform Act of 1986, the *lowest* multifamily starts level was 336,000 in 1976.²⁷) Virtually all of the percentage changes are statistically significant, but since 18.5 percent of the 2013 affordable rental stock was built in 1985 or later – after the 1985 AHS – there must necessarily be declines in the percentage for units that were built earlier.

²⁶ We adopt the standard statistical convention of assuming a rectangular distribution of units within each bracket – 10 percent of those built between 1950 and 1959 are assumed to have been built in each year of the decade, for example. We recognize that housing construction is highly cyclical and the number of new units fluctuates from year to year, but we have no basis for assuming anything about the year (before 1985) in which a unit was removed from the inventory.

²⁷ Data are taken from Haver Analytics, Inc., Series DLXVG3 – [HST5@USECON].

The size distribution of each category (measured in terms of bedrooms) changed slightly over the period. There was a decline in smaller units and an offsetting increase in larger ones; the median number of bedrooms in affordable rental units was slightly above 1.9 in 1985 and above 2.1 in 2013. Also, affordable rental units had almost the same number of bedrooms as higher-rent units.

In 1985, affordable rental units were more concentrated in rural and non-metropolitan areas, higher-rent units in urban areas – cities as well as suburbs. By 2013, surprisingly, the share of affordable rental housing in the suburbs had increased – from about 21 percent of affordable rental housing to 28 percent. There were small offsetting declines in each of the other for locations. This continued a trend that we saw in our first report: By 2005, the suburban share of affordable rental units had risen by five percentage points, from 21 percent to 26 percent, while the share located in cities declined by four percentage points, from 47 percent to 43 percent. These changes were both statistically significant.

Since we first became involved with housing policy some 45 years ago, there have been efforts to enable lower-income families to move to decent housing in the suburbs. This dates back at least to the Section 236 program, enacted under President Johnson and adopted as a vehicle for achieving suburbanization by HUD Secretary George Romney. In our judgment, the changes we are reporting here suggest that the policy objective, despite many fits and starts over the years, has been at least somewhat effective.

Having said that, it should be emphasized that these are aggregate figures for all central cities, all suburbs, etc., in the United States. They do not apply to any specific city or metropolitan area. We will present information about some of the largest cities and MSAs later, in Chapter 6.

Finally, in both years affordable rental housing was disproportionately located in the Midwest (and to a lesser extent the South), and disproportionately underrepresented in the West (and to a lesser extent the Northeast). The shares located in the South and the West both increased; the share located in the East declined. Affordability was less of a problem in the Midwest and South as of 2013: 20 percent of very low income households lived in the Midwest, and 27 percent of the affordable rental housing was located there; 34 percent of very low income households lived in the South, and 36 percent of the affordable rental housing was located in that region. By contrast, 21 percent of very low income households lived in the East, and 25 percent in the West, compared to 19 percent and 18 percent, respectively, of the affordable rental stock.²⁸

The last panel of Table 3-13 cross-classifies metropolitan areas by region and size. Larger MSA are identified in the AHS – a total of 144; smaller ones are not, but are grouped with non-metropolitan areas, by region. The only statistically significant change over the 20 years was a decline in the share of affordable rental housing located in smaller Eastern MSAs and non-metropolitan areas in that region.

²⁸ The distribution of renters is take from U.S. Department of Housing and Urban Development, *Worst Case Housing Needs, 2015 Report to Congress* (2015), Table A10. The data for multifamily starts only go back to 1959.

There was a great deal of change within the affordable rental stock – fewer than half the units that were affordable in 1985 were affordable in 2013, fewer than a quarter were affordable in every year. There were also changes in the characteristics of the affordable rental stock over that period. These are less pronounced than one might expect from the changes among specific units. Affordable units were to be found more often in large structures in 2013, less often in single-family detached houses; but a majority of the affordable rental stock was still located in small buildings. By location, affordable units in 2013 were found more often in the suburbs, and in the South and West; less often in central cities, and in the East and Midwest, compared to 1985. More significant than the regional changes, however, is the increase in affordable rental housing within the metropolitan areas that are identified in the AHS; the last categorization in the table separates the identified MSA, which are the large ones, and the remaining small MSAs and non-metropolitan areas in each of the four regions.

The Quality of Affordable Rental Housing

We now turn our attention to how well affordable rental housing compares in quality to other types of housing. Quality consists of many dimensions:

- size (square footage, number of rooms or bedrooms, or number of baths, etc.),
- amenities (air conditioning, fireplaces, decks or porches, garages, pools, Wi-Fi and cable connections, etc.),
- condition (paint, carpets, appliances, etc.),
- presence or absence of problems (with electrical, plumbing, or heating systems, pests, etc.),
- lot size, and
- location (commuting and shopping convenience, schools, parks, good or bad neighborhood features, scenic views, etc.).

In determining affordability, we controlled for number of bedrooms. Economic theory tells us that, within the same market, the lower rent of affordable rental units must be associated lower quality on one or more of these dimensions than units that command high rents. Table 3-13 shows that affordable units are generally older than other rental units and therefore less likely to have the latest amenities and more likely to have experienced deterioration.

Table 3-13. Characteristics of Affordable Rental Housing, 1985 and 2013

	1985	1985	1985	2013	2013	2013
	Affordable	Moderate	High	Affordable	Moderate	High
Structure type						
Mobile home	5.8%	2.6%	0.6%	6.2%	2.9%	1.0%
Single-family detached	31.9%	24.4%	26.9%	27.7%	28.8%	32.2%
Single-family attached	5.8%	6.0%	7.8%	5.0%	7.4%	6.9%
2-4 unit structure	23.5%	23.3%	16.5%	21.5%	17.9%	13.3%
5-9 unit structure	11.5%	15.0%	12.2%	12.9%	13.6%	9.1%
10-19 unit structure	7.3%	13.3%	11.6%	10.7%	14.2%	9.5%
20-49 unit structure	6.2%	9.0%	10.6%	7.7%	9.1%	10.5%
50 or more unit structure	8.1%	6.4%	13.8%	8.3%	6.2%	17.6%
Year Built						
1919 or earlier	16.5%	8.6%	6.1%	8.9%	6.0%	6.6%
1920-1929	9.3%	7.1%	4.4%	5.8%	3.9%	5.2%
1930-1939	10.3%	7.3%	5.1%	5.9%	4.4%	5.2%
1940-1949	10.9%	9.0%	6.2%	7.2%	5.4%	6.6%
1950-1959	11.0%	11.9%	9.6%	9.2%	8.8%	7.6%
1960-1969	12.9%	17.0%	16.4%	12.6%	12.3%	8.9%
1970-1974	10.4%	13.5%	15.8%	11.4%	9.4%	6.4%
1975-1979	12.1%	16.3%	18.5%	13.3%	11.7%	7.7%
1980-1984	4.8%	6.8%	13.7%	7.1%	7.0%	4.6%
1985-1989	0.6%	1.7%	3.8%	5.3%	8.9%	8.0%
1990-1994	0.1%	0.1%	0.1%	3.2%	3.9%	4.1%
1995-1999	0.6%	0.4%	0.2%	3.3%	6.1%	6.1%
2000-2004	0.3%	0.1%	0.0%	3.6%	5.5%	9.0%
2005-2009	0.2%	0.1%	0.0%	2.5%	5.5%	10.6%
2010-2013	0.0%	0.0%	0.0%	0.6%	1.0%	3.5%
Median year built	1957	1962	1970	1970	1975	1978
Age of Structure						
64yrs or more	47.0%	32.0%	21.8%	27.8%	19.8%	23.6%
54-64 years	11.0%	11.9%	9.6%	9.2%	8.8%	7.6%
39-53 years	23.3%	30.5%	32.2%	24.0%	21.7%	15.3%
29-38 years	16.9%	23.2%	32.2%	20.4%	18.7%	12.3%
19-28 years	0.8%	1.8%	3.9%	8.6%	12.9%	12.0%
14-18 years	0.6%	0.4%	0.2%	3.3%	6.1%	6.1%
9-13 years	0.3%	0.1%	0.0%	3.6%	5.5%	9.0%

4-8 years	0.2%	0.1%	0.0%	2.5%	5.5%	10.6%
0-3 years	0.0%	0.0%	0.0%	0.6%	1.0%	3.5%
Median age	61 years	50 years	45 years	45 years	39 years	35 years
Number of bedrooms						
No bedrooms	4.9%	3.4%	3.6%	1.8%	1.1%	1.8%
One bedroom	27.5%	29.5%	28.4%	24.1%	21.7%	23.3%
Two bedrooms	38.3%	44.5%	39.0%	36.6%	36.9%	31.2%
Three bedrooms	20.9%	16.7%	21.0%	21.1%	22.8%	23.8%
Four bedrooms	4.8%	3.0%	3.8%	5.2%	5.1%	8.0%
Five bedrooms	1.0%	0.3%	0.1%	1.2%	0.7%	1.5%
Six or more bedrooms	0.3%	0.1%	0.1%	0.2%	0.1%	0.3%
Median	1.9	1.9	2.0	2.1	2.2	2.3
Metropolitan Location						
Central city	45.5%	48.0%	46.0%	41.5%	40.2%	51.3%
Urban suburb	20.8%	34.8%	42.5%	27.8%	36.2%	33.2%
Rural suburb	8.5%	4.9%	3.2%	7.5%	7.7%	5.9%
Urban non-metro	11.1%	7.6%	5.4%	11.1%	8.5%	4.7%
Rural non-metro	14.1%	4.7%	2.9%	11.4%	6.6%	4.2%
Region						
Northeast	21.9%	21.6%	25.3%	18.7%	15.6%	25.1%
Midwest	29.1%	20.9%	7.8%	27.3%	17.0%	7.9%
South	34.0%	33.1%	29.4%	36.0%	39.1%	28.2%
West	15.0%	24.3%	37.5%	18.1%	28.3%	38.8%
Northeast	8.6%	4.7%	3.0%	6.9%	5.0%	4.2%
Midwest	16.2%	7.4%	1.7%	14.6%	7.5%	2.6%
South	22.3%	13.0%	8.4%	22.5%	20.1%	13.7%
West	7.9%	7.2%	5.7%	8.3%	11.3%	10.6%
Identified metros	45.0%	67.6%	81.1%	47.7%	56.2%	69.0%

Since lower quality is virtually assured for affordable rental units, we focus instead on whether these units provide acceptable housing. The Housing Act of 1949 set the goal of national housing policy as providing “a decent home and a suitable living environment.” The AHS provides a measure of adequacy that helps address the question of acceptability. We also use a broader measure of deficiencies.

The AHS measure of adequacy

The AHS contains many variables that describe the quality of both a housing unit and its neighborhood.²⁹ However, the AHS has only one variable that assess the overall adequacy of a unit; this variable (ZADEQ) classifies units into three categories: adequate, moderately inadequate, and severely inadequate.³⁰ This variable has some important limitations. HUD and the Census Bureau changed the definition of this variable in 2007 so its comparability over time is somewhat problematic. More importantly, the variable focuses on the worst physical deficiencies so that, while it does a good job of identifying units with serious problems, it does not differentiate quality among the remaining units. For example, in 2013, only 1.6 million units were classified as severely inadequate (1.7 % of the 95.6 million units that were assessed) and only 3.2 million as moderately inadequate (3.4 percent).

Table 3-14 reports, for each survey year, the percentage of units that were classified as either moderately or severely inadequate by the unit’s status in that survey year. The AHS stopped classifying URE and seasonal units with respect to physical adequacy in 1997.

Four things stand out from this table. First, with the exception of URE and seasonal units, the percentage of moderately or severely inadequate units is consistently higher among affordable rental units than other types of housing. Second, the incidence of problems declines across the affordability spectrum with owner stock units consistently having the lowest incidence. Third, the adequacy of the housing stock has been improving over time as the incidence of moderate or severe physical problems has declined almost monotonically from 1985

²⁹ For a discussion of the variables relating to the physical condition of a units, see Frederick J. Eggers and Fouad Moumen, *Housing Adequacy and Quality As Measured by the AHS*, March 2013, available at https://www.huduser.gov/portal/publications/ahsrep/AHS_hsg_adequacy.html.

³⁰ A unit is considered severely inadequate (ZADEQ = 3) if any of the following criteria apply 1. Unit does not have hot and cold running water. 2. Unit does not have a bathtub or shower. 3. Unit does not have a flush toilet. 4. Unit shares plumbing facilities. 5. Unit was cold for 24 hours or more and more than two breakdowns of the heating equipment have occurred that lasted longer than 6 hours. 6. Electricity is not used. 7. Unit has exposed wiring, not every room has working electrical plugs, and the fuses have blown more than twice. 8. Unit has five or six of the following structural conditions: a. Unit has had outside water leaks in the past 12 months. b. Unit has had inside water leaks in the past 12 months. c. Unit has holes in the floor. d. Unit has open cracks wider than a dime. e. Unit has an area of peeling paint larger than 8 by 11 inches. f. Rats have been seen recently in the unit. If a unit is not severely inadequate (ZADEQ = 3), then it is moderately inadequate (ZADEQ = 2) if 9. Unit has 3 or 4 of the structural conditions listed under number 8 above; 10. Unit had more than 2 breakdowns of the toilet that lasted longer than 6 hours; 11. The main heating equipment is unvented room heaters burning kerosene, gas, or oil; or 12. The unit is lacking complete kitchen facilities (a sink, refrigerator, and range, cookstove, microwave, or built-in cooking burners in the kitchen). This definition applies to 2007 and later years. Previously, problems in hallways and stairways entered into the definition of moderately inadequate.

to 2013 within each housing type. Fourth, in any given survey, the large majority of affordable rental units are judged to be adequate.

Table 3-14
Percent of Units with Moderate or Serious Physical Problems

Survey	Affordable Rental	Moderate Rental	High Rent	Owner stock	URE or Seasonal stock
1985	20.0%	12.5%	9.1%	6.9%	28.2%
1987	16.8%	9.9%	8.1%	6.0%	28.8%
1989	17.7%	11.2%	9.8%	7.1%	28.9%
1991	16.6%	10.0%	8.8%	7.3%	27.0%
1993	14.2%	9.0%	7.9%	5.9%	25.7%
1995	14.3%	9.6%	9.1%	6.2%	24.9%
1997	14.6%	9.7%	8.4%	4.5%	NA
1999	14.2%	10.1%	7.7%	4.3%	NA
2001	13.0%	9.6%	7.7%	4.0%	NA
2003	11.6%	9.2%	8.5%	3.7%	NA
2005	11.6%	9.8%	8.9%	3.5%	NA
2007	10.7%	9.2%	7.7%	3.0%	NA
2009	10.6%	7.7%	7.7%	3.3%	NA
2011	11.5%	8.5%	7.7%	3.2%	NA
2013	10.4%	8.2%	6.7%	2.9%	NA

An Alternative Definition of Poor Quality

In previous work, Eggers and Moumen attempted to construct a broader measure of quality that would use more of the information available from the AHS.³¹ Their Poor Quality Index (PQI) differs from the AHS measure in three important ways. First, the PQI is numerical, not categorical. The more deficiencies, the higher the PQI. Under the AHS measure, an occupied unit cannot receive a worse categorization than severely inadequate regardless of its condition. Second, the PQI responds to deficiencies not included in the AHS measure, such as sagging roofs. Third, every observed deficiency increases the PQI score, whereas sometimes in the AHS measure deficiencies must occur in fixed combinations. For example, having exposed wiring results in a PQI score of 4 even if every room has plugs. In the AHS measure, exposed wiring, the absence of plugs, and blown fuses must occur together to create an inadequacy. Because the PQI provides a different look at the suitability of housing units, we use it as well as the AHS measure to assess the relative quality of affordable housing.³²

³¹ Frederick J. Eggers and Fouad Moumen, *A Measure of (Poor) Housing Quality*, March 2013, available at https://www.huduser.gov/portal/publications/pdf/AHS_hsg.pdf.

³² The Poor Quality Index has its own limitations. As the name implies, PQI measures deficiencies and ignores differences among units in amenities. The PQI is a weighted sum of deficiencies and, while the many of the weights

Table 3-15 reports, for each survey year, the percentage of units that were classified as a PQI rating between 11 and 20 or more than 20. The index is constructed so that any of the conditions that would warrant a judgment of severely inadequate using the AHS measure would generate a PQI score of 10. Because the PQI considers a broader range of problems than the AHS adequacy measure, the proportion of the housing stock with problems is higher when assessed using the PQI. For example, in 2013, 71.0 percent of the housing stock had a PQI score of zero compared to 94.9 percent that were classified as adequate according to the AHS measure.

With minor modifications, the same four findings stand out in this table. First, with the exception of URE and seasonal units, the percentage of units with high PQI scores is consistently higher among affordable rental units than other types of housing. (PQI scores are available for URE and seasonal unit in all survey years.) Second, the incidence of problems declines across the affordability spectrum with owner stock units consistently having the lowest incidence. Third, the level of deficiencies in the housing stock declined from 1985 through 1995, then shifted upward in 1997 (perhaps due to changes in both the AHS instrument and the data collection procedures); and then declined again from 1997 through 2013. Fourth, in any given survey, the large majority of affordable rental units are judged to be acceptable.

are based on how the Census Bureau determines the ZADEQ classification, they are subjective. The PQI is an ordinal measure in the sense that a unit with a PQI score of 20 is not necessarily twice as deficient as one with a score of 10. Finally, the PQI deals only with unit problems and ignores neighborhood problems. The advantages of the PQI are twofold. First, because it considers a wider range of deficiencies, the PQI can differentiate more fully among housing units. In 2013, 95 percent of all housing were deemed as adequate using ZADEQ whereas only 71 percent of units had no deficiencies according to PQI. Second, the condition of “having problems” is more stable under the PQI measure. Generally, only 30 to 45 percent of units judged moderately inadequate or severely inadequate in one survey were in the moderately inadequate or severely inadequate categories in the next survey. Approximately 60 percent of units with a non-zero PQI in one survey have a non-zero PQI in the next survey.

Table 3-15. High Scores on the Poor Quality Index

Survey Year & PQI Range	Affordable Rental	Moderate Rental	High Rent	Owner stock	URE or Seasonal stock
1985: 11-20	10.7%	7.4%	5.5%	4.3%	8.8%
21+	5.9%	2.3%	1.8%	1.0%	6.9%
1987: 11-20	9.2%	5.6%	4.2%	3.2%	10.2%
21+	3.4%	1.7%	1.4%	0.7%	6.3%
1989: 11-20	9.6%	5.5%	4.6%	3.5%	9.5%
21+	3.0%	1.8%	0.9%	0.7%	5.9%
1991: 11-20	8.8%	5.0%	4.2%	3.4%	9.9%
21+	2.8%	1.2%	1.0%	0.7%	5.5%
1993: 11-20	8.1%	5.5%	4.1%	3.2%	8.9%
21+	2.8%	1.3%	0.8%	0.6%	6.4%
1995: 1-10	7.8%	4.6%	3.4%	2.7%	9.5%
11+	2.4%	1.1%	1.0%	0.6%	5.5%
1997: 11-20	9.2%	6.5%	5.2%	4.5%	10.1%
21+	5.4%	3.1%	2.4%	1.6%	9.3%
1999: 11-20	8.6%	6.5%	4.6%	4.2%	10.4%
21+	4.8%	3.0%	2.2%	1.4%	10.5%
2001: 11-20	8.2%	6.6%	5.1%	4.2%	9.9%
21+	5.0%	3.7%	2.3%	1.6%	10.6%
2003: 11-20	7.4%	5.6%	5.3%	3.6%	9.8%
21+	4.3%	2.5%	3.1%	1.3%	10.1%
2005: 11-20	7.3%	5.4%	5.1%	3.5%	7.8%
21+	3.8%	2.7%	2.7%	1.2%	10.8%
2007: 11-20	5.8%	4.1%	3.6%	3.1%	7.4%
21+	2.7%	1.7%	1.1%	1.0%	9.0%
2009: 11-20	5.5%	4.0%	3.7%	3.3%	6.0%
21+	2.4%	1.9%	1.3%	1.2%	8.9%
2011: 11-20	4.8%	3.5%	3.1%	3.1%	8.0%
21+	2.2%	1.5%	1.1%	1.0%	9.1%
2013: 11-20	3.9%	2.9%	2.6%	2.5%	7.2%
21+	1.8%	1.2%	0.9%	0.8%	8.1%

Consistency of Unit Quality over Time

The pictures painted by the first two tables changes a little when we look at the quality of individual units over time. Table 3-16 considers only the 60.5 million units that were in the housing stock every survey year from 1985 to 2013 and that were never used as URE or seasonal units. The columns in the left panel count the number of times that a unit was classified as either moderately inadequate or severely inadequate. The columns in the right panel record the average PQI score into four categories. The rows in both panels classify the units by their history in the housing market from 1985 to 2013. We limit analysis to units that have an uncomplicated history, e.g. they are always affordable or always in the owner stock, in order to be able to draw clear implications from any differences observed.

Most units encounter some problems over a long time period. When we look at all 15 surveys that cover 1985 through 2013, somewhat more than half of all the units studied (58.4 percent) were never classified as either moderately or severely inadequate, according to the AHS measure; but by the same token fairly close to half (41.6 percent) were moderately or severely inadequate at least once. According to the broader Poor Quality index, only 1.6 percent of all the units studied had no reported deficiencies in the 15 surveys. Still, a very large majority of the stock was in good shape over the period. By the AHS measure, 95.8 percent of the units were either always adequate or adequate in 12 or more of the 15 surveys. By the PQI, 98.6 percent of the units had an average PQI score of 10 or less.

Clear differences appear in the last two columns of each panel. Two percent of the always affordable rentals were considered moderately or severely inadequate in more than half of the 15 surveys. Another 7.3 percent of the always affordable units were moderately or severely inadequate in at least four surveys and perhaps in as many as seven surveys. Incidence rates were lower in the last two columns for always moderate rentals and none of the 95,000 always high rent units had more than 3 instances of being moderately or severely inadequate. The owner stock also had low incidence rates in the last two columns.

The PQI measure shows even more dramatically that over the long term very few units are always free from problems. Only 1.6 percent of all units had an average PQI score of zero. At the same time, only 1.4 percent of all units had an average PQI score above 10. Always affordable units were more likely than other rental units or owner-occupied units to experience problems over multiple years. Among always affordable units, 3.3 percent had average PQI scores above 10 compared to 1.3 percent of always moderate rentals, 0.6 percent of owner-occupied units, and no units that always commanded high rents.

Table 3-16
Alternative Quality Ratings for Rental Affordability Status, 1985-2013

<i>Units in the 1985 and 2013 stocks and either part of the renter stock or the owner stock in each survey</i>	<i>Number of units</i>	<i>Number of Surveys with Either Moderate or Severe Physical Problems</i>				<i>Average PQI score</i>			
		<i>None</i>	<i>1 to 3</i>	<i>4 to 7</i>	<i>8 or more</i>	<i>Zero</i>	<i>1 to 10</i>	<i>11 to 20</i>	<i>21 +</i>
<i>Always Affordable Rental</i>	<i>3,196,000</i>	<i>38.7%</i>	<i>52.0%</i>	<i>7.3%</i>	<i>2.0%</i>	<i>1.6%</i>	<i>95.2%</i>	<i>3.2%</i>	<i>0.1%</i>
<i>Always Moderate Rental</i>	<i>358,000</i>	<i>42.0%</i>	<i>53.3%</i>	<i>4.0%</i>	<i>0.6%</i>	<i>0.6%</i>	<i>98.1%</i>	<i>1.3%</i>	<i>0.0%</i>
<i>Always High Rent</i>	<i>95,000</i>	<i>26.2%</i>	<i>73.8%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>2.3%</i>	<i>97.7%</i>	<i>0.0%</i>	<i>0.0%</i>
<i>Filter down monotonically</i>	<i>860,000</i>	<i>43.4%</i>	<i>52.4%</i>	<i>3.2%</i>	<i>0.9%</i>	<i>1.1%</i>	<i>98.3%</i>	<i>0.6%</i>	<i>0.0%</i>
<i>Gentrified up monotonically</i>	<i>202,000</i>	<i>35.4%</i>	<i>53.5%</i>	<i>9.0%</i>	<i>2.1%</i>	<i>0.0%</i>	<i>95.8%</i>	<i>2.1%</i>	<i>2.1%</i>
<i>Other always rental</i>	<i>7,877,000</i>	<i>34.6%</i>	<i>57.4%</i>	<i>7.2%</i>	<i>0.9%</i>	<i>0.9%</i>	<i>96.9%</i>	<i>2.1%</i>	<i>0.1%</i>
<i>Always owner</i>	<i>28,222,000</i>	<i>72.2%</i>	<i>26.0%</i>	<i>1.1%</i>	<i>0.7%</i>	<i>2.3%</i>	<i>97.0%</i>	<i>0.6%</i>	<i>0.0%</i>
<i>Sometimes rental, sometimes owner</i>	<i>19,715,000</i>	<i>52.6%</i>	<i>42.2%</i>	<i>3.9%</i>	<i>1.3%</i>	<i>1.0%</i>	<i>97.4%</i>	<i>1.6%</i>	<i>0.1%</i>
<i>Total</i>	<i>60,526,000</i>	<i>58.4%</i>	<i>37.4%</i>	<i>3.2%</i>	<i>1.0%</i>	<i>1.6%</i>	<i>97.0%</i>	<i>1.3%</i>	<i>0.1%</i>

A Brief Look at Quality Changes Associated with Filtering and Gentrifying

We included units that filtered monotonically or gentrified monotonically to be complete, but it is difficult to draw any implications for these units from the preceding table because our analysis does not specify when the problems occurred, that is, before, during, or after they filtered or gentrified.

There were 688,000 high rent units in 1985 that became affordable by 2013; the top panel of Table 3-17 compares the acceptability of those units to similar units in both years and examines whether acceptability declined for the group after they had filtered. Using the AHS measure, there is no difference in 1985 between the units that filtered and all high rent units, while in 2013 the units that filtered appear to be modestly better on average than were all affordable units.

The PQI scores tell a somewhat different story. The units that filtered had fewer zero scores in 1985 than did all high rent units, but they also had fewer units with a PQI score of 10 or less. After filtering, these units had better PQI scores in 2013 than affordable units in general. Overall, units that filtered were not as good in 1985 as high rent units that did not filter, but they were better in 2013 than other affordable units.

There were 337,000 units that were affordable in 1985 that became high rent in 2013; the bottom table on the preceding page compares the acceptability of those units to similar units in both years and examines whether acceptability improved for the group after gentrification had been completed. Under the AHS measure, the units that gentrified were as a group marginally better than all the affordable units in 1985 and were marginally worse as a group than all the high rent units in 2013. (There is, however, one odd result: units that were affordable in 1985 and gentrified by 2013 were in worse condition after they gentrified than before – 3.6 percent were severely inadequate in 1985 and 5.5 percent in 2013.)

The same pattern appears when the PQI is used. The units that gentrified had more zero scores in 1985 than all affordable rental units. After gentrifying, these units had worse PQI scores in 2013 than high rent units in general. They were better than other affordable units in 1985, but not as good as other high rent units in 2013.

We think these results are quite plausible.

Table 3-17
Quality Ratings for Housing Units that Filtered or Gentrified, 1985 to 2013

Panel A: Units that Filtered

	Adequate	Moderately Inadequate	Severely inadequate	PQI score zero	PQI score 1-10	PQI score 11-20	PQI score 20+
All high rent units in 1985	90.9%	7.2%	1.8%	53.1%	39.7%	5.5%	1.8%
Units that filtered: 1985	90.8%	7.1%	2.1%	49.7%	43.8%	4.8%	1.7%
All affordable units in 2013	89.6%	7.0%	3.4%	67.3%	27.1%	3.9%	1.8%
Units that filtered: 2013	88.0%	8.1%	3.9%	74.3%	22.4%	2.0%	1.3%

Panel B: Units that Gentrified

	Adequate	Moderately Inadequate	Severely inadequate	PQI score zero	PQI score 1-10	PQI score 11-20	PQI score 20+
All affordable units in 1985	80.0%	15.2%	4.8%	41.0%	42.4%	10.7%	5.9%
Units that gentrified: 1985	82.7%	13.7%	3.6%	44.9%	42.5%	8.5%	4.0%
All high rent units in 2013	93.3%	4.4%	2.3%	74.2%	22.3%	2.6%	0.9%
Units that gentrified: 2013	89.9%	4.7%	5.5%	63.2%	31.4%	4.1%	1.3%

Quality of Assisted Housing Units

Our estimates indicate that public housing, privately owned HUD assisted projects, and other forms of housing assistance that resides with the tenant have provide more than 3 million units of affordable rental housing every year throughout the 1985-2013 period. The suitability of that housing is an important question in its own right. Table 3-18 use the AHS measure and the PQI to assess the extent to which assisted housing meets the goal of providing decent homes and compares the quality of assisted units to other affordable rental units.

In 1985, 80.0 percent of affordable housing was judged adequate by the AHS measure; 91.8 percent of assisted housing was adequate compared to 76.9 percent of unassisted affordable rentals, a difference of 15.0 percentage points. By the AHS measure, a higher percentage of assisted units were adequate than unassisted affordable units in every survey year except 2011. Over the 28 years, the percentage of assisted units considered adequate trended downward from 91.8 percent in 1985 to 89.7 percent in 2013. During the same period, the percentage of unassisted affordable units considered adequate trended upward from 76.9 percent in 1985 to 89.6 percent in 2013. The differences in adequacy between assisted housing and unassisted affordable housing virtually disappear by 2013.

In 1985, 41.0 percent of affordable rental housing were free from deficiencies; 52.2 percent of assisted housing were free of deficiencies, compared to 38.0 percent of unassisted affordable rentals, a difference of 14.2 percentage points. Throughout the 15 surveys, a higher percentage of assisted units were without deficiencies than unassisted affordable rental units. The difference between assisted and unassisted affordable rentals narrowed throughout the period to the point that the difference had almost disappeared by 2013. An importance difference between the assessment of relative quality by the AHS measure and the PQI index is that assisted units improved in quality over the period by the deficiency measure but declined in quality by the adequacy measure. Nevertheless, a higher percentage of assisted units were adequate (89.7) at the end of the period than were without deficiencies (67.7 percent).

We speculate that the relative decline in the quality of assisted units over the period is probably due to the change in the relative age structure of the two groups on units. In 1985, the assisted stock was younger than the unassisted affordable rental stock. Half of all affordable rental units in 1985 had been built before the early-1950s (see Table 3-13). According to Weicher's data, as previously noted, there were 2.9 million units of assisted housing in 1985, two-thirds of which entered the stock after 1970.³³ Since there were only a few hundred thousand new assisted units built after 1985, the assisted stock aged by 28 years over the period. The overall affordable rental stock had become newer by 2013, with half of the units built after 1970. If our speculation is correct, we can expect the assisted stock to become progressively less adequate and have more deficiencies than the unassisted affordable rental stock in the future.

³³ John C. Weicher, *Housing Policy at a Crossroads*, pp. 111-115.

Table 3-18
Suitability of Affordable Rental Housing, Assisted vs. Unassisted

Survey Year	Adequate by AHS measure				PQI score = zero (no deficiencies)			
	All Affordable Rental	Assisted Rental Housing	Unassisted Affordable Rental Housing	Assisted – Unassisted *	All Affordable Rental	Assisted Rental Housing	Unassisted Affordable Rental Housing	Assisted – Unassisted *
1985	80.0%	91.8%	76.9%	15.0 pp	41.0%	52.2%	38.0%	14.2 pp
1987	83.2%	90.9%	81.2%	9.7 pp	47.1%	56.4%	44.8%	11.6 pp
1989	82.3%	90.3%	80.4%	9.9 pp	48.3%	55.4%	46.7%	8.8 pp
1991	83.4%	89.1%	82.1%	7.0 pp	49.5%	56.2%	48.0%	8.2 pp
1993	85.8%	92.6%	84.3%	8.3 pp	49.4%	57.3%	47.7%	9.6 pp
1995	85.7%	91.7%	84.3%	7.4 pp	51.4%	57.0%	50.0%	7.0 pp
1997	85.4%	90.2%	84.3%	6.0 pp	49.0%	54.7%	47.7%	7.1 pp
1999	85.8%	90.1%	84.8%	5.3 pp	49.5%	56.7%	48.0%	8.7 pp
2001	87.0%	89.9%	86.3%	3.6 pp	52.4%	59.7%	50.8%	8.9 pp
2003	88.4%	90.5%	88.0%	2.5 pp	54.5%	59.3%	53.5%	5.8 pp
2005	88.4%	89.0%	88.2%	0.8 pp	55.7%	58.9%	55.0%	3.9 pp
2007	89.3%	90.3%	89.1%	1.3 pp	63.2%	68.0%	62.2%	5.7 pp
2009	89.4%	91.3%	89.0%	2.3 pp	63.5%	66.2%	62.9%	3.3 pp
2011	88.5%	87.3%	88.7%	-1.5 pp	63.0%	65.3%	62.6%	2.6 pp
2013	89.6%	89.7%	89.6%	0.2 pp	67.3%	67.7%	67.2%	0.5 pp

* Numbers may not add due to rounding.

Appendix to Chapter 3: The Impact of Variation in the Reported Number of Bedrooms

In the course of our analysis of rental dynamics between 1985 and 2005, we became concerned about the possible effect of variation in the reported number of bedrooms on our determination of the affordability of units.

We define a rental unit to be affordable if the sum of rent plus utilities and other related costs, adjusted for the number of bedrooms, is less than or equal to 30 percent of 50 percent of local area median income. We believe that what is considered affordable for a one-bedroom unit should be less than what is considered affordable for a two-bedroom unit. Federal housing policy has recognized this principle for years in the way it determines eligibility for assisted housing. Eligibility for assisted housing varies by household size, with larger households able to qualify at higher income than smaller households. Since we are looking at units and not households, the adjustment should be made on the housing cost side rather than the income side. We do this by following a technique espoused in HADS.³⁴ This combines the HUD adjustment for household size with the rules of the Low Income Housing Tax Credit program on expected size of household by number of bedrooms.

From previous work, we were aware that the reported number of bedrooms for a given unit can change between surveys. HUD encouraged us to examine how this survey-to-survey variation might affect determinations of affordability.³⁵ This research found:

- For the 43,000 units in both the 2009 and 2011 AHS surveys, 18 percent of respondents reported a different number of bedrooms in the two surveys.
- For the period studied, structural alterations that might produce real changes in the number of bedrooms appeared not to have been an explanation of this variation. The paper concluded that survey error is probably the most important explanation of survey-to-survey variation in bedroom counts.
- The study also concluded that this variation had little impact on the reported affordability of rental units for purposes of the rental dynamic studies commissioned by HUD. More than 90 percent of the market rental units in the sample retained the same affordability classification when the bedroom counts from the 2009 survey were used to determine affordability in both 2009 and 2011

This research left two questions unanswered. First, over a longer timeframe, could survey-to-survey variation in bedroom counts distort findings on the affordability of rental

³⁴ The 2007 HADS documentation at http://www.huduser.org/intercept.asp?loc=/Datasets/hads/HADS_doc.pdf, pp 10-11.

³⁵ Frederick J. Eggers & Fouad Moumen, *Between-Survey Changes in the Number of Bedrooms in a Unit: How Often? Why? Effect on Measures of Rental Affordability?*, October 2103, available at https://www.huduser.gov/portal/publications/ahsrep/AHS_number_of_bedrooms.html.

housing? And, second, could survey-to-survey variation in bedroom counts lead to overestimation of the level of movement of rental units among affordability categories. We attempted to answer these questions with respect to our analysis of rental dynamics between 1985 and 2013.

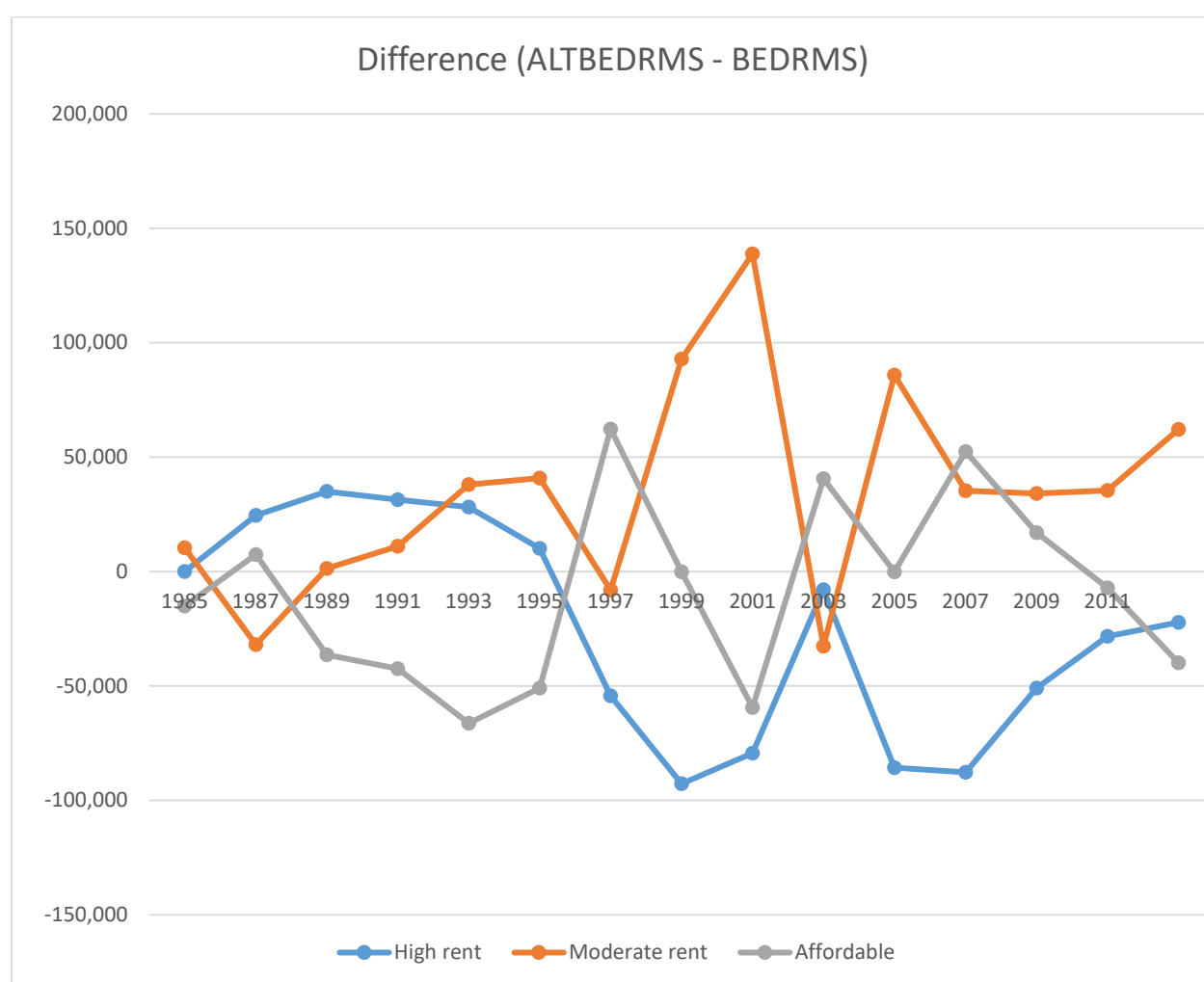
We looked at the extent to which bedroom counts vary across surveys for the 65,540 units in our longitudinal sample and created rules to restrict survey-to-survey variation. The AHS variable that records the number of bedrooms is called BEDRMS. We constructed an alternative count called ALTBEDRMS in the following way.

1. 48.6 percent of the sample units have the same value for BEDRMS in every survey that has a value for BEDRMS. ALTBEDRMS is the same as BEDRMS for these units and does not vary across surveys.
2. 24.6 percent of the sample units have more than one value for BEDRMS but the first recorded value of BEDRMS is the same as the last recorded value. For these units, ALTBEDRMS uses the modal value for BEDRMS for all survey years. If there is more than one modal value (e.g., 6 surveys with BEDRMS = 2 and 6 survey with BEDRMS = 3), ALTBEDRMS uses the larger modal value, in this case 3. ALTBEDRMS does not vary across surveys. The choice of the larger modal value presumes that the unit is large enough to accommodate the higher number of bedrooms and, therefore, its affordability should be based on that count. ALTBEDRMS differs from BEDRMS in 19.2 percent of the observations.
3. 4.2 percent of the sample units (a) have more than one value for BEDRMS, (b) the first recorded value of BEDRMS is not the same as the last recorded value, and (c) the units are either manufactured housing or located in a structure with 5 or more units. For these units, ALTBEDRMS uses the modal value for BEDRMS for all survey years. If there is more than one modal value, ALTBEDRMS uses the larger modal value. ALTBEDRMS does not vary across surveys. ALTBEDRMS differs from BEDRMS in 28.6 percent of the observations.
4. 22.6 percent of the sample units (a) have more than one value for BEDRMS, (b) the first recorded value of BEDRMS is not the same as the last recorded value, and (c) the units are either single-family structures (detached or attached) or located in a structure with 2-4 units. For these units, ALTBEDRMS uses the first recorded value of BEDRMS for all surveys until the recorded value of BEDRMS equals the last recorded value and then use the last recorded value for all subsequent surveys. For example, if the BEDRMS = {3,3,3,5,3,4,4,4,6,4,4,5,4,4,4} are the recorded values from 1985 through 2013, then ALTBEDRMS uses 3 bedrooms for 1985 through 1993 and then uses 4 bedrooms from 1995 through 2013. ALTBEDRMS takes two different values for each of these units across surveys but there is only one break point. ALTBEDRMS differs from BEDRMS in 20.2 percent of the observations.

Note that ALTBEDRMS is missing if and only if BEDRMS is missing. Also note that using ALTBEDRMS instead of BEDRMS only affects the affordability determination; it cannot affect the count of units in the stock, the count of units in the rental stock, or the count of assisted units.

The following chart reports the differences in the counts of affordable rental units, moderate rental units, and high rent units across all 15 surveys when we use ALTBEDRMS instead of BEDRMS. The differences are small, never exceeding 150,000 units in any given survey year.

Chart 3A – 1. Differences between Bedroom Counts by Year



We divided the reported difference in each survey year by the average number of units across all 15 surveys in that affordability classification. The largest variation reported for high rent units was 1.7 percent in 1999 when ALTBEDRMS reduced the count of high rent units by 93,000. The largest variation for moderate rent units was 0.9 percent in 2001 when

ALTBEDRMS increased the count of moderate rent units by 139,000. The largest variation for affordable rent units was 0.4 percent in 1993 when ALTBEDRMS reduced the count of affordable rent units by 66,000.

Table 3A-1. Bedroom Counts by Affordability, 1985 and 2013

	BEDRMS	BEDRMS	ALTBEDRMS	ALTBEDRMS
Affordable in 1985 & 2013	6,243,000	NA	6,263,000	NA
Assisted in both years	3,141,000	NA	3,141,000	NA
Unassisted affordable in both years	3,102,000	100.0%	3,122,000	100.0%
Unassisted always affordable	55,000	1.8%	71,000	2.3%
Always affordable except for one blip	549,000	17.7%	652,000	20.9%
Affordable but one blip to moderate	262,000	8.4%	272,000	8.7%
Affordable but one blip to high	34,000	1.1%	41,000	1.3%
Affordable but one blip to owner	66,000	2.1%	87,000	2.8%
Affordable but one blip to seasonal/URE	100,000	3.2%	111,000	3.6%
Affordable but one blip to temp loss	87,000	2.8%	141,000	4.5%
Units with more than one blip	2,499,000	80.6%	2,398,000	76.8%

In our analysis of rental dynamics between 1985 and 2013, we focus on two measures of stability in the housing stock: (1) the extent to which units have the same classification in all surveys in which they are part of the housing stock, e.g., always affordability, and (2) the extent of “blips” in affordability. A “blip” is a brief departure from the pattern of being always affordable. In Table 3A-1, we apply these two measures to the units that were affordable rentals at both the beginning (1985) and end (2013) of our study. Because assisted units are always affordable, we remove them from the analysis so as not to imply greater stability to the affordable category.

If we had restricted the survey-to-survey variation in the count of the number of bedrooms, our reported results would have changed as follows:

- The number of units affordable in both years would increase by 20,000 – 0.3 percent.
- The number of unassisted units that were affordable in all 15 surveys would increase by 16,000, changing the contribution of these units from 1.8 percent to 2.3 percent. While this change is relatively large, it is substantively unimportant.
- The number of single blips increase by 103,000. This is a large increase. By implication, there must have been a large number of cases where the number of blips were small and therefore restricting the variation in the bedroom counts reduced the number of blips to zero (always affordable) or one (except for one blip).
- Nevertheless, the share of units affordable in both 1985 and 2005 that had more than one blip decreased only modestly – from 80.6 percent to 76.8 percent.

All in all, restricting the variation in bedroom counts would have had only a small effect on our characterization of the dynamics between 1985 and 2013.

Chapter 4. Affordable Rental Housing from 1984 through 2013

The American Housing Survey gives us some important insights into affordable rental housing. The experience of the 1985-2013 period shows that what is affordable today may not be affordable 30 years from now. Thanks to the AHS, we know what happened to these no-longer-affordable units. Similarly, we can explain where the affordable rental units in 2013 came from. Examining the changing role that a housing unit plays in the housing market has been the central focus of this study. To obtain these insights, the last chapter compared the status of housing units at the beginning and the end of the period and looked at the multiplicity of “career paths” that trace how units change their roles over time. This chapter extends the analysis by looking at the provision of affordable rental housing *throughout* the period.

This chapter will:

- Calculate the amount of affordable rental housing supplied over the 1984-2013 period and compare this total to the amounts of other types of housing supplied.
- Examine the types and locations of units that provided affordable rental housing and examine how the mix of units in 2013 compares to the mix in 1985 with respect to the characteristics associated with the provision of affordable rental housing
- Analyze the consistency with which units furnished affordable rental housing throughout the period and look for patterns that might identify units that should be preserved.
- Assess the contributions to affordable rental housing of units that dropped out of or were added to the inventory during the period.

Unit Years of Housing

To look at affordable rental housing *throughout* the entire period, we developed the concept of *unit years* of housing. If 100 units furnish affordable rental housing for 10 years, we record this activity as 1,000 unit years of affordable rental housing. Similarly, 100 units furnishing 10 years of owner-occupied housing would be said to provide 1,000 unit years of owner stock. Of course, the same unit can provide unit years of different types of housing, for example, 8 unit years of affordable rental, 4 unit years of seasonal housing, and 10 unit years in the owner stock. Unit years of affordable rental housing can be provided by units following a variety of paths.

The unit-year concept appears simple and intuitively appealing but implementing it, like any good movie, requires some “willing suspense of disbelief.” We presume that the status of a unit observed by the AHS at a point in time represents the type of housing supplied by that unit for the two years between AHS surveys. For example, if a unit is in the owner stock in the 1985 AHS survey, we presume that it was an owner unit throughout both 1984 and 1985.³⁶ This

³⁶ This assumption brings 1984 into the analysis and expands the period to 30 years, 1984 through 2013 inclusive.

presumption actually consists of two assumptions, one regarding the timing of changes and one regarding the number of changes. If the AHS reports that a unit is owner stock in 1985 and an affordable rental in 1987, we assume that the owner status ran from January 1, 1984 to December 31, 1985 and that the affordable rental status ran from January 1, 1986 to December 31, 1987. This timing assumption is admittedly arbitrary but not disturbing. The actual change could have taken place on July 1, 1986; in which case, the unit would have been owner stock for 2.5 years and an affordable rental for 1.5 years. While our estimate of unit years by status would be inaccurate for this unit, there will undoubtedly be some other unit that changed status from owner to affordable rental in September 1985 producing a partially offsetting error. We believe and assume that changes in status from one survey to the next occur randomly between the dates of the two surveys.

We also assume the AHS observes all the changes in status. In the context of the example in the preceding paragraph, we assume that the unit was an owner unit for part of the 1984-1987 period and an affordable rental for part of the same period *and* that that the unit had no other status during this period as, for example, a moderate rental from November 1985 to March 1987.³⁷ We recognize that it is likely some units in the AHS sample will have undergone more than one change in status between surveys and that the AHS will have missed all but the last change. However, we believe that more than one change is unlikely in a two-year period. The discussion of paths in Chapter 3 revealed that a large number of units never change status over the entire period and that long strings of the same status across successive surveys are commonplace.

While approximate, the unit-year approach enables us to exploit the information in the AHS more fully. Now we can assess the extent of affordable housing throughout the period rather than just at the beginning or end and gain a better understanding of the consistency with which units are affordable to renters. We can also study the contribution of various types of units to affordable rental housing and determine how location, age and type of structure, and other factors affect the potential of units to serve as affordable rentals. We can bring into the analysis units not included in the discussion so far, such as units that were added to the housing stock after 1985 and left the stock before 2013 – as shown in Table 3-1, there are 6.2 million units that fit this description. Because these 6.2 million units were not part of the housing stock in either 1985 or 2013, they were omitted from our previous discussion of how the housing stock evolved between these years. The benefits of the unit-year approach make the minimal suspension of disbelief required more than worthwhile.

Table 4-1 uses unit years to measure the total activity of the housing stock from 1984 through 2013. Over these 30 years, the housing stock supplied almost 3.6 billion unit years of housing, of which about 1.15 billion unit years (32.2 percent) were rental housing, including 535.7 million unit years (15.1 percent) of affordable rental housing.

³⁷ The AHS normally collects data between April and September of a survey year. Therefore, this hypothetical change would have occurred after the 1985 survey data were collected and before the 1987 data were collected.

Table 4-1. Unit years of Housing by Status: 1984 through 2013

Type of housing	Unit years of housing (in millions)	Percent of total	Average unit years per year
Affordable rental	535.7	15.1%	17,857,000
Moderate rental	448.3	12.6%	14,943,000
High rental	163.1	4.6%	5,437,000
All rental stock	1,147.1	32.2%	38,237,000
Owner stock	2,159.6	60.7%	71,987,000
Seasonal or URE	251.1	7.1%	8,370,000
Total Housing Stock	3,557.9	100.0%	118,597,000

The portrayal in Table 4-1 of the types of housing available throughout the 30-year period is consistent with the snapshots of the housing stock in 1985, 1995, 2005, and 2013 discussed in Chapter 3. Slightly more than 30 percent of the unit years were rental and just over 60 percent were devoted to owner stock; the remainder of the unit years was used by second homes, seasonal units, and vacant units for migratory workers and other unusual vacancies. Almost half (47 percent) of the rental unit years were classified as affordable. This average picture is also a close approximation to the pattern in each of the 15 survey years.

In Chart 4-1, we plot the ratio of the rental stock to the housing stock and the ratio of the affordable rental stock to the entire rental stock for each of the 15 AHS surveys. Rentals range from a high of 34.5 percent of the stock in both 1987 and 1989 to a low of 29.8 percent in 2007. The decline between 1993 and 2005 matches the steady increase in the homeownership rate, beginning in 1994. The affordable share of the rental stock rose unevenly from a low of 43.5 percent in 1985 to a high of 50.1 percent in 2003 and then declined to 45.5 percent in 2013.

The next sections of this chapter use the unit-year approach to gain further insight into where affordable housing comes from.

Characteristics of Affordable Rental Housing: 1984-2013

In Chapter 3, we compared rental housing in 2013 by rent level (affordable, moderate, and high) to rental housing in 1985, to see whether the characteristics of affordable rental housing had changed over the two decades and to compare the characteristics of affordable rentals to those of higher rent units. (See Table 3-13 and related discussion.) Here we carry out a similar analysis but with different objectives. Now we want to learn whether differences in the characteristics of units, such as location, structure type, age, and size, were related to the production of unit years of affordable rental housing during the 30-year period from 1984 through 2013. In particular, we want to find out whether some types of units contributed more to affordable rental housing than other types over this period. Then we will compare the 1985 and 2013 housing stocks to gauge whether the composition of the stock in 2013 is as favorable as the composition was in 1985 for the provision of affordable rental housing in the future.

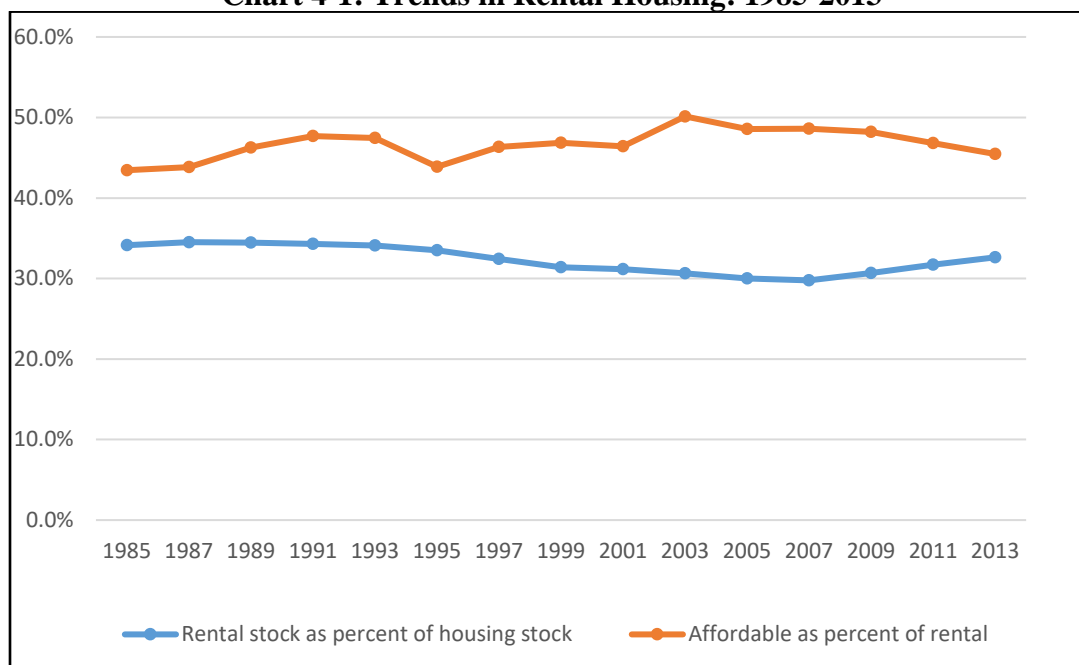
Chart 4-1: Trends in Rental Housing: 1985-2013

Table 4-2 takes the unit years of housing reported by status in Table 4-1 and allocates them by location, structure type, age of structure, and number of bedrooms. The unit years by status within each grouping add up to the total in the bottom row and each row sum across to the total in the “all housing” column. The locational grouping combines the unit years occurring in all central cities into the first row; units in suburbs and non-metropolitan areas are allocated over the next four rows depending upon whether they are located in urbanized or rural areas. Chapter 6 presents data on affordable rental housing in seven large metropolitan areas and the central city and suburban components of three of them.

We use Table 4-2 to construct Tables 4-3 and 4-4, which are the tables discussed in the remainder of this section. Table 4-3 calculates column percentages within each group; for example, under Structure Type, mobile homes furnished only 5.9 percent of all unit years of affordable rental housing. Table 4-4 calculates row percentages independent of other rows; for example, under Structure Type, of all the unit years of housing provide by mobile homes, 12.5 percent were unit years of affordable rental housing.

Table 4-2. Unit Years of Housing by Status and Characteristics, 1984-2013
(in millions of unit years)³⁸

	Affordable Rental	Moderate Rental	High Rental	All rentals	Owner	Seasonal	All housing
Location							
In central cities	240.0	195.2	77.2	512.3	503.2	43.7	1,059.2
Urban suburbs	133.9	166.8	59.1	359.7	755.9	48.2	1,163.9
Rural suburbs	41.7	25.7	9.5	76.9	355.2	35.6	467.7
Urban non-metro	57.4	35.8	9.9	103.2	159.6	25.8	288.5
Rural non metro	62.7	24.9	7.4	95.0	385.7	97.8	578.5
Structure type							
Mobile homes	31.6	11.7	2.0	45.3	169.5	37.5	252.2
Single-family, detached	146.7	107.1	46.8	300.6	1,764.7	139.8	2,205.0
Single-family, attached	28.9	27.8	12.1	68.8	107.0	12.9	188.7
2-4 unit structures	124.2	94.0	25.8	244.0	51.1	19.7	314.9
5-9 unit structures	69.7	68.4	17.5	155.7	18.0	9.9	183.6
10-19 unit structures	51.6	66.0	17.9	135.5	14.7	8.8	159.0
20-49 unit structures	37.9	43.5	16.4	97.8	13.2	10.4	121.4
50+ unit structures	45.0	29.8	24.6	99.4	21.4	12.1	133.0
All 5+ unit structures	204.3	207.7	76.4	488.4	67.4	41.2	597.1
Age of structure							
1949 and earlier	188.5	113.4	40.2	342.1	491.2	70.7	904.1
1950-1969	126.2	105.8	32.2	264.2	581.5	56.0	901.6
1970-1989	187.2	185.2	64.4	436.8	724.8	88.6	1,250.2
1990-2013	33.7	43.9	26.4	104.0	362.1	35.8	502.0
Number of bedrooms							
Efficiency	17.2	9.8	4.8	31.8	2.1	6.9	40.7
One bedroom	153.0	129.1	44.2	326.3	54.1	38.7	419.1
Two bedrooms	216.9	202.0	63.2	482.1	447.1	103.0	1,032.3
Three bedrooms	121.2	91.1	39.8	252.2	1,147.2	78.7	1,478.1
Four bedrooms	22.2	14.1	9.7	46.1	418.3	18.8	483.2
Five bedrooms	4.3	1.7	1.3	7.3	76.5	3.8	87.6
Six or more	0.8	0.4	0.2	1.3	14.2	1.2	16.8
Total	535.7	448.3	163.1	1,147.1	2,159.6	251.1	3,557.9

³⁸ ³⁸ Numbers for individual categories may not add to totals because of rounding.

Contributors to Affordable Rental Housing

Table 4-3 identifies the major contributors to affordable rental housing within each group of characteristics. The findings here are consistent with those from Table 3-13. While Table 3-13 found some minor changes between 1985 and 2013 in the characteristics of units that provided affordable rental housing in those years, the major contributors in 1985 were still major contributors in 2013. Therefore, it is not surprising that these same characteristics distinguish the major contributors throughout the 30-year period. The chief findings are:

- Rentals of all types were concentrated in central cities. While only 30 percent of all unit years of housing were located in central cities (calculated from the last column of Table 4-3), 45 percent of rental unit years (calculated from the “all rentals” column of Table 4-3) and also 45 percent of affordable rental unit years (Table 4-3) were in central cities. The urbanized parts of non-metropolitan areas are the only other locational category which provide a larger share of affordable rental housing than of all housing; they contributed another 10.7 percent of the affordable rental housing stock. The owner stock tended to be more suburban; seasonal units/second homes were concentrated in the rural parts of non-metropolitan areas.
- During the 1984-2013 period, single-family houses (detached and attached) and units in structures containing 2 to 4 units contributed more than half of the unit years of affordable rental housing (56.0 percent), while units in multifamily structures (those containing 5 or more units) provided close to an additional 40 percent. Mobile homes were not an important factor in affordable rental housing; they furnished less than 6 percent of the unit years.
- Over the period, 93.7 percent of the unit years of affordable housing were furnished by units built prior to 1989, compared to 83.9 percent of the unit years of all housing. Units built prior to 1959, and thus over 50 years old in 2013, provided 35.2 percent of the affordable rental housing stock.
- Two-bedroom units were the most common type of rental unit throughout the period (42.0 percent) and the most common type of affordable rental as well (40.5 percent). Units with three bedrooms provided 22.6 percent of the affordable rental stock and 22.0 percent of all rental housing. Units with four or more bedrooms provided 5.1 percent of the affordable rental stock, and 4.7 percent of all housing. These comparisons are of interest because of the long-standing policy concern that there are not enough large affordable rental units.

**Table 4-3. Unit Years of Housing by Status and Characteristics, 1984-2013:
Percentages by Characteristic within Status³⁹**

Location	Affordable Rental	Moderate Rental	High Rental	All rentals	Owner	Seasonal	All housing
In central cities	44.8%	43.5%	47.3%	44.7%	23.3%	17.4%	29.8%
Urban suburbs	25.0%	37.2%	36.2%	31.4%	35.0%	19.2%	32.7%
Rural suburbs	7.8%	5.7%	5.8%	6.7%	16.4%	14.2%	13.1%
Urban non-metro	10.7%	8.0%	6.1%	9.0%	7.4%	10.3%	8.1%
Rural non metro	11.7%	5.5%	4.6%	8.3%	17.9%	39.0%	16.3%
Structure type							
Mobile homes	5.9%	2.6%	1.2%	3.9%	7.8%	14.9%	7.1%
Single-family, detached	27.4%	23.9%	28.7%	26.2%	81.7%	55.7%	62.0%
Single-family, attached	5.4%	6.2%	7.4%	6.0%	5.0%	5.2%	5.3%
2-4 unit structures	23.2%	21.0%	15.8%	21.3%	2.4%	7.8%	8.8%
5-9 unit structures	13.0%	15.3%	10.7%	13.6%	0.8%	3.9%	5.2%
10-19 unit structures	9.6%	14.7%	11.0%	11.8%	0.7%	3.5%	4.5%
20-49 unit structures	7.1%	9.7%	10.1%	8.5%	0.6%	4.1%	3.4%
50+ unit structures	8.4%	6.7%	15.1%	8.7%	1.0%	4.8%	3.7%
All 5+ unit structures	38.1%	46.3%	46.8%	42.6%	3.1%	16.4%	16.8%
Age of structure							
1949 and earlier	35.2%	25.3%	24.6%	29.8%	22.7%	28.2%	25.4%
1950-1969	23.6%	23.6%	19.7%	23.0%	26.9%	22.3%	25.3%
1970-1989	34.9%	41.3%	39.5%	38.1%	33.6%	35.3%	35.1%
1990-2013	6.3%	9.8%	16.2%	9.1%	16.8%	14.3%	14.1%
Number of bedrooms							
Efficiency	3.2%	2.2%	2.9%	2.8%	0.1%	2.7%	1.1%
One bedroom	28.6%	28.8%	27.1%	28.4%	2.5%	15.4%	11.8%
Two bedrooms	40.5%	45.1%	38.8%	42.0%	20.7%	41.0%	29.0%
Three bedrooms	22.6%	20.3%	24.4%	22.0%	53.1%	31.3%	41.5%
Four bedrooms	4.2%	3.2%	5.9%	4.0%	19.4%	7.5%	13.6%
Five bedrooms	0.8%	0.4%	0.8%	0.6%	3.5%	1.5%	2.5%
Six or more	0.1%	0.1%	0.1%	0.1%	0.7%	0.5%	0.5%

³⁹ By simple tests of the differences between percentages, every measurable difference on this table is statistically significant because of the large sample sizes. The unit of observation is a unit year and, therefore, a single sample unit can generate 11 observations. However, the simple tests are not adequate because the units of observation tied to a particular sample unit are not independent of each other.

Characteristics of Units That Are Frequently Affordable

Table 4-4 distributes (in percentage terms) across the five housing statuses all the unit years of housing furnished by units with specific characteristics. The difference between Table 4-3 and Table 4-4 is that the former shows the share of affordable housing unit years that fall within each location or structural characteristic, while the latter shows how many of the unit years provided by housing with a given characteristic consist of affordable rental housing. For example, single-family detached structures provide over a quarter (27.6 percent) of all affordable rental unit years (Table 4-3), but only 6.7 percent of all the unit years they produced were affordable rental housing (Table 4-4). The large contribution from single-family detached structures results from their numbers, not from their proclivity to serve as affordable rentals.

Table 4-4 measures the percentage by status of all unit years of housing. This can also be interpreted as the *average* proportion of time in the housing inventory spent in a particular status for all units with specific characteristics. The bottom row, which averages across all characteristics, serves as a useful comparison. This Table clearly shows wide variation within each group in the average proportion of time as an affordable rental. The chief findings were:

- Twenty-two percent of central city housing was affordable rental housing compared to around 10 percent of suburban housing and 15 percent of housing nationwide. Almost 20 percent of the unit years of housing in the urbanized parts of non-metropolitan areas were affordable rentals compared to only 11 percent in the rural parts of these areas.
- Units in 2-to-4 unit structures spent 39.4 percent of their unit years as affordable rental housing. Units in multifamily structures spent 34.2 percent of their unit years as affordable rentals with 5-to-9 unit structures topping the group with 38.8 percent of their unit years as affordable rentals.
- Older units also spent, on average, a substantially higher percentage of their unit years as affordable rental housing. Units built prior to 1950 were affordable rentals on average 20.9 percent of the time they were in the inventory; those built in 1990 or later were on average affordable rental only 6.7 percent of the time.
- There were marked differences by bedroom size in the percentage of unit years in the housing stock that were affordable. On average, all units were affordable for 15.1 percent of their unit years in the inventory. Units with zero, one, and two bedrooms had substantially larger proportions while units with three or more bedrooms had substantially smaller proportions. The fact that larger units are typically owner stock units explains this pattern.

**Table 4-4. Unit Years of Housing by Status and Characteristics, 1984-2013:
Percentages by Status for Each Characteristic⁴⁰**

Location	Affordable Rental	Moderate Rental	High Rental	All rentals	Owner	Seasonal	All housing
In central cities	22.7%	18.4%	7.3%	48.4%	47.5%	4.1%	100.0%
Urban suburbs	11.5%	14.3%	5.1%	30.9%	64.9%	4.1%	100.0%
Rural suburbs	8.9%	5.5%	2.0%	16.4%	75.9%	7.6%	100.0%
Urban non-metro	19.9%	12.4%	3.4%	35.8%	55.3%	8.9%	100.0%
Rural non metro	10.8%	4.3%	1.3%	16.4%	66.7%	16.9%	100.0%
Structure type							
Mobile homes	12.5%	4.6%	0.8%	18.0%	67.2%	14.9%	100.0%
Single-family, detached	6.7%	4.9%	2.1%	13.6%	80.0%	6.3%	100.0%
Single-family, attached	15.3%	14.7%	6.4%	36.5%	56.7%	6.9%	100.0%
2-4 unit structures	39.4%	29.9%	8.2%	77.5%	16.2%	6.3%	100.0%
5-9 unit structures	38.0%	37.3%	9.5%	84.8%	9.8%	5.4%	100.0%
10-19 unit structures	32.5%	41.5%	11.3%	85.2%	9.2%	5.5%	100.0%
20-49 unit structures	31.2%	35.8%	13.5%	80.6%	10.9%	8.6%	100.0%
50+ unit structures	33.8%	22.4%	18.5%	74.7%	16.1%	9.1%	100.0%
All 5+ unit structures	34.2%	34.8%	12.8%	81.8%	11.3%	6.9%	100.0%
Age of structure							
1949 and earlier	20.9%	12.5%	4.4%	37.8%	54.3%	7.8%	100.0%
1950-1969	14.0%	11.7%	3.6%	29.3%	64.5%	6.2%	100.0%
1970-1989	15.0%	14.8%	5.2%	34.9%	58.0%	7.1%	100.0%
1990-2013	6.7%	8.7%	5.3%	20.7%	72.1%	7.1%	100.0%
Number of bedrooms							
Efficiency	42.3%	24.0%	11.7%	78.0%	5.1%	16.9%	100.0%
One bedroom	36.5%	30.8%	10.5%	77.9%	12.9%	9.2%	100.0%
Two bedrooms	21.0%	19.6%	6.1%	46.7%	43.3%	10.0%	100.0%
Three bedrooms	8.2%	6.2%	2.7%	17.1%	77.6%	5.3%	100.0%
Four bedrooms	4.6%	2.9%	2.0%	9.5%	86.6%	3.9%	100.0%
Five bedrooms	5.0%	1.9%	1.5%	8.4%	87.3%	4.4%	100.0%
Six or more	4.5%	2.4%	1.1%	8.0%	84.7%	7.4%	100.0%
All units	15.1%	12.6%	4.6%	32.2%	60.7%	7.1%	100.0%

⁴⁰ By simple tests of the differences between percentages, every measurable difference on this table is statistically significant because of the large sample sizes. The unit of observation is a unit year and, therefore, a single sample unit can generate 11 observations. However, the simple tests are not adequate because the units of observation tied to a particular sample unit are not independent of each other.

Prospects for the Future

Table 4-5 looks at the beginning and end of the period, and also an intermediate year, to see if any noteworthy changes occurred in the composition of the overall housing stock by unit characteristics. Most of the differences are statistically significant even though there are few substantial differences.

Table 4-5. Comparison of Housing Stock Characteristics: 1985, 2005, and 2013

Location	1985 Housing Stock	2005 Housing Stock	2013 Housing Stock	Percentage point difference: 1985-2005	Percentage point difference: 2005-2013	Percentage point difference: 1985-2013
In central cities	32.1%	28.7%	28.7%	-3.4%	0.0%	-3.3
Urban suburbs	31.8%	33.0%	33.1%	1.1%	0.2%	1.3
Rural suburbs	11.5%	13.9%	13.7%	2.4%	-0.2%	2.2
Urban non-metro	8.8%	7.8%	8.0%	-0.9%	0.1%	-0.8
Rural non metro	15.8%	16.6%	16.5%	0.8%	-0.1%	0.7
Structure type						
Mobile homes	7.3%	7.0%	6.6%	-0.3%	-0.5%	-0.8
Single-family, detached	61.5%	62.5%	63.7%	1.0%	1.1%	2.2
Single-family, attached	4.8%	5.4%	5.7%	0.5%	0.3%	0.9
2-4 unit structures	9.8%	8.4%	8.0%	-1.4%	-0.4%	-1.8
5-9 unit structures	5.2%	5.1%	4.9%	-0.1%	-0.2%	-0.3
10-19 unit structures	4.2%	4.5%	4.5%	0.4%	0.0%	0.3
20-49 unit structures	3.4%	3.4%	3.5%	0.0%	0.1%	0.1
50+ unit structures	3.8%	3.7%	3.9%	-0.1%	0.3%	0.2
All 5+ unit structures	16.5%	16.7%	16.8%	0.2%	0.2%	0.3
Age of structure						
1949 and earlier	32.3%	23.0%	20.9%	-9.4%	-2.1%	-11.4
1950-1969	31.0%	23.3%	21.6%	-7.8%	-1.6%	-9.4
1970-1989	35.1%	33.3%	31.3%	-1.7%	-2.1%	-3.8
1990-2013	1.6%	20.4%	27.0%	18.9%	6.5%	25.4
Number of bedrooms*						
Efficiency	1.8%	1.0%	0.8%	-0.8%	-0.2%	-1.0
One bedroom	13.0%	10.4%	9.7%	-2.6%	-0.7%	-3.3
Two bedrooms	32.0%	25.0%	23.0%	-7.0%	-2.0%	-9.0
Three bedrooms	36.6%	36.7%	35.5%	0.0%	-1.2%	-1.1
Four bedrooms	10.8%	13.2%	13.6%	2.4%	0.5%	2.9
Five bedrooms	1.9%	2.7%	3.0%	0.8%	0.4%	1.1
Six or more bedrooms	0.4%	0.6%	0.6%	0.1%	0.0%	0.1

*Percentages do not sum to 100% because of missing information for some units.

We focus only on the characteristics that identified units that spent a large portion of their time in inventory as affordable rental housing. Table 3-13 discussed changes in the affordable rental stock by characteristic. The chief findings from Table 4-5 are:

- There was a 3.3 percentage point decline in the proportion of the housing stock located in central cities. Central city housing was more frequently affordable rental housing than was the overall stock. The central city decline was offset by modest growth in rural areas, both suburban and non-metropolitan.
- The 2013 housing stock looks very much like the 1985 stock with respect to the distribution by structure type. The category whose units had the highest average proportion of time in inventory as affordable rentals – 2-to-4 unit structures – experienced the largest decline in percentage terms. The category that provided the lowest percentage of affordable rental years – single-family detached homes – experienced the largest increase.
- The 2013 housing stock has smaller percentages of units with zero to three bedrooms, and larger percentages of units with four to six bedrooms, than the stock in either 2005 or 1985.

All of these findings suggest that the affordable rental housing stock would decline as a share of the total stock.

Consistency in Affordable Rental Housing

The previous chapter studied the variety of “career paths” that units take during their time in the housing stock. The experience of the surveys between 1985 and 2013 was marked by both consistent and inconsistent behavior on the part of housing units. A large number of units followed very simple career paths, such as always being in the owner stock. But another large group of units followed a multitude of complicated paths that were shared by very few, if any, other units. The previous chapter examined other types of consistency in career paths by counting the number of units (1) that were always affordable throughout the period, (2) that were always affordable except for one “blip,” and (3) that filtered or gentrified smoothly.

In this chapter, we extend that analysis by focusing on consistency in providing unit years of affordable rental housing. We say that a unit behaved consistently if most of its time in the inventory was as an affordable rental unit. We are interested in *consistency* because the concept has an important bearing on strategies for promoting affordable rental housing. If a large share of the unit years of affordable rental housing were provided by units that were consistently affordable, then strategies aimed at preserving these units make sense. Whether the consistently affordable units are private market units or federally assisted units affects the strategies employed to preserve the units.

Patterns of Consistency

To produce a measure of consistency for every unit that was in the stock at sometime from 1984 through 2013, we used the AHS to estimate the proportion of time that a unit spent as an affordable rental unit. We also estimated the unit years of affordable rental housing provided by each unit. Table 4-6 combines the results of these two calculations.

**Table 4-6. Frequency Distributions of Units and Unit Years
by Percent of Unit Years as Affordable Rental Housing**

Unit Years of Affordable Housing as a Percent of Unit Years of Housing	Units (in thousands)	Percent of Units	Cumulative Percent of Units	Unit Years (in millions)	Percent of Unit Years	Cumulative Percent of Unit Years
100%	6,653	4.3%	4.3%	131.8	24.6%	24.6%
90%-99%	1,084	0.7%	5.0%	28.1	5.2%	29.8%
80%-89%	3,064	2.0%	6.9%	63.2	11.8%	41.6%
70%-79%	2,062	1.3%	8.3%	36.1	6.7%	48.4%
60%-69%	3,796	2.4%	10.7%	57.6	10.8%	59.1%
50%-59%	3,612	2.3%	13.0%	37.4	7.0%	66.1%
40%-49%	4,359	2.8%	15.8%	50.0	9.3%	75.5%
30%-39%	4,020	2.6%	18.4%	30.7	5.7%	81.2%
20%-29%	8,697	5.6%	24.0%	50.5	9.4%	90.6%
10%-19%	8,345	5.4%	29.4%	28.7	5.4%	96.0%
1%-9%	10,765	6.9%	36.3%	21.5	4.0%	100.0%
0%	99,112	63.7%	100.0%	0.0	0.0%	100.0%
Total	155,571			535.7		

Table 4-6 clearly shows that, from 1984 through 2013, the large majority of housing units never engaged in offering affordable rental housing (63.7 percent). Another substantial share provided affordable rental housing less than 20 percent of their time in inventory (12.3 percent). Only 4.3 percent of all units served exclusively as affordable rental housing for all their time in the housing stock during this period. An additional 2.7 percent were affordable more than 80 percent but less than 100 percent of their time in inventory.

For units that were in the AHS for all 15 surveys between 1985 and 2013, the left-hand column in Table 4-6 translates easily into the number of surveys in which it was affordable: “1%-9%” corresponds to one survey out of 15; “10%-19%” corresponds to two surveys out of 15; and so on. The percentages also include units in the survey fewer than 15 times, however.

Table 4-6 tells a very interesting story. The seven percent of all units that were affordable rental housing for at least 80 percent of their time in the inventory accounted for over 40 percent of all the unit years of affordable rental housing. The 75 percent of units that were affordable rental housing less than 20 percent of their time in the inventory provided less than 10

percent of all the unit years of affordable rental housing. The 17 percent of all units that fell between these extremes and were occasionally affordable rental housing provided almost half (49 percent) of the unit years of affordable rental housing.

Leaving out the units which never provided rental housing, the distribution is still skewed.

- About 20 percent of the units that provided some affordable rental housing were affordable at least 80 percent of the time and provided over 40 percent of the affordable housing stock.
- About 12 percent of the units that provided some affordable rental housing were affordable less than 20 percent of the time and provided about 10 percent of the affordable rental housing stock.
- The remaining two-thirds of the units that provided some affordable rental housing – more than 20 percent of the time, less than 80 percent – provided almost half of the affordable rental housing stock (49 percent).

It is very informative to classify units by how much affordable rental housing they provide and the path they follow as they provide it. To do this, we develop in Table 4-7 a set of 12 mutually exclusive categories based on their history with respect to providing affordable rental housing. The two far-left columns of Table 4-7 number and list the 12 categories. The first three categories encompass units that were always or almost always affordable; category 4 consists of units that were always rental but never affordable; categories 5 and 6 contain units that were always rental and filtered or gentrified smoothly; categories 7 and 8 include the remainder of the units that were always rental, distinguished by whether they were affordable rentals more or less than half of their time in the housing stock; categories 9 and 10 contain those units that were sometimes rental and sometimes non-rental, distinguished by whether more or less than half of their time in the housing stock was as affordable rentals; category 11 contains units that were permanently out of the stock by 2013; and category 12 consists of all units that were never rental and therefore never affordable.

Column A gives the weighted count of units in each category, in thousands. Columns B and C estimate the number of unit years, in millions, of both affordable rental housing and housing in general provided by each category. Columns D and E measures the contribution of each category to the total number of unit years of affordable housing and housing of all types. Column F calculates the average number of unit years of affordable rental housing provided by units in each category; Column G calculates the average number of unit years of housing provided. Column H is the ratio of column F to column G and is conceptually similar to the measure of consistency used in Table 4-6.⁴¹

⁴¹ Column H is the ratio of the mean years as affordable rental housing to the mean years in the housing stock, each of the two means calculated over all units. Mathematically it is not equal to the mean of the ratio of years in affordable rental housing to years in the housing stock, calculated over all units.

Table 4-7. Units and Unit Years of Housing and Affordable Rental Housing by Rental History

		A	B	C	D	E	F	G	H
	All counts in millions	Number of units (in 1,000s)	Unit years of affordable rental housing (in millions)	Unit years of housing (in millions)	Percent of unit years of affordable housing	Percent of unit years of housing	Average number of unit years of affordable housing	Average number of unit years of housing	Ratio of average affordable to average years in stock
	Total	155.6	535.7	3,557.9	100.0%	100.0%	3.44	22.87	0.15
1	Always affordable	4.0	106.5	106.5	19.9%	3.0%	26.46	26.46	1.00
2	Always rental and always affordable except for 1 survey	0.5	11.5	12.5	2.1%	0.4%	22.67	24.67	0.92
3	Always affordable when rental but not rental in 1 survey	0.7	13.8	14.7	2.6%	0.4%	19.85	21.15	0.94
4	Always moderate or high rent	3.3	0.0	67.6	0.0%	1.9%	0.00	20.66	0.00
5	Filter down monotonically to affordable	1.1	13.9	26.0	2.6%	0.7%	12.40	23.19	0.53
6	Gentrify monotonically from affordable	0.4	3.9	7.2	0.7%	0.2%	9.71	17.71	0.55
7	Always rental, at least half affordable	2.8	55.3	79.7	10.3%	2.2%	19.86	28.64	0.69
8	Always rental, less than half affordable	6.1	33.5	165.7	6.3%	4.7%	5.48	27.10	0.20
9	Not always rental, at least half affordable	5.8	102.3	151.0	19.1%	4.2%	17.77	26.24	0.68
10	Not always rental, less than half affordable	44.4	130.4	1,176.5	24.4%	33.1%	2.94	26.48	0.11
11	Permanent loss to stock	20.8	64.6	226.0	12.1%	6.4%	3.11	10.88	0.29
12	Never rental	65.7	0.0	1,524.4	0.0%	42.8%	0.00	23.20	0.00

Separating the stock into these 12 categories further illuminates the broad patterns seen in Table 4-6. Of the 155.6 million units that were part of the housing stock sometime between 1984 and 2013, over 40 percent (the 65.7 million in category 12) were never rental and consequently never affordable rentals; these units provided 42.8 percent of all housing over the period but none of the affordable rental housing. Another, much smaller, number of units were always rental but never provided affordable housing (the 3.3 million in category 4). At the other extreme, 4.0 million units (row 1) were always rental and always affordable while they were in the housing stock; these units provided 19.9 percent of the affordable rental housing. Eliminating categories 4 and 12 leaves approximately half (55.7 percent) of the units that provided housing. With the exception of some units in category 11, every one of these remaining units was an affordable rental at least once and was something other than an affordable rental at least once.

The units in categories 2 through 11 account for 80.1 percent of the affordable rental housing. For the most part, affordable rental housing appears to have been provided by units that are not always affordable. The units that fall into categories 1, 2, and 4 through 8 were always rental.⁴² Combined these categories account for only 41.9 percent of the unit years of affordable rental housing. This means that well over half of the unit years of affordable housing were provided by units that were not always rental. In fact, units that were not always rental and were affordable less than half the time provided 24.4 percent – just less than one quarter – of all unit years of affordable rental housing.

The conclusions of the preceding two paragraphs create the motivation for studying more carefully what constitutes consistency in the provision of affordable rental housing and assessing its importance.

The Contribution of Units That Were Almost Always Affordable

To get a better sense of consistency among rental units, we look further at categories 2 and 3. These categories contain the units whose career paths involved the “blips” discussed in Chapter 3. Category 2 – units that were always rental and always affordable except for one survey – is a small but interesting group. Our analysis treats affordability as an “either/or” situation. We class a unit as affordable if the combination of rent and utilities is less than or equal to 30 percent of 50 percent of local median income adjusted for the number of bedrooms. Some units can be at or marginally below this dividing line and therefore still be classified as affordable rentals, while other units may be marginally above and be classified as moderate rentals. This category picks up units that fall above the line – perhaps only marginally – just one time. For all practical purposes, the role played by these units in the housing market is essentially the same as the “always affordable” units.

⁴² Table 4-7 includes both units that were in 1985 stock and units added to the stock after 1985. In this context, “always rental” means either always rental from 1985 on or always rental once the unit entered the stock after 1985.

Category 3 is similar to category 2 except that the single deviation from being affordable involved being something other than rental. There are three options: these units could have been part of the owner stock, used as second homes or seasonal units, or been temporarily out of the stock for one survey.⁴³ It turns out that 67.2 percent of the 695,000 units in this category – 467,000 units – were either part of the owner stock or second homes or seasonal units for that one survey; the remaining 32.8 percent were temporarily out of the stock. This latter group of 244,000 units is also essentially the same as category 1 and can be considered consistently rental.

Table 4-8 combines the contributions to affordable rental housing of the units in categories 1 and 2 and the units in category 3 that were either always rental or out of the stock on a temporary basis for year. Combined the three groups account for only 3.1 percent of all units but they provide 23.0 percent of all affordable rental housing. Even with this adjustment, it appears that most affordable rental housing (77.0 percent) is provided by units that were not always affordable. Nevertheless this small group of units plays a key role in providing affordable rental housing.

**Table 4-8. Unit years of Housing and Affordable Rental Housing by Units That Were Always Affordable or Almost Always Affordable
(in millions of units and unit-years)**

	Number of units	Unit years of affordable housing	Unit years of housing
Total (all categories)	155.6	535.7	3,557.9
Always affordable	4.0	106.5	106.5
Always rental and always affordable except for 1 survey	0.7	11.5	12.5
Always affordable when rental but temporarily out of the stock in 1 survey	0.2	5.2	5.2
Total of last three rows	4.9	123.2	124.2
Percent of overall total	3.1%	23.0%	3.5%

The Contribution of Federally Assisted Housing

Before looking at the other categories, a natural question is the extent to which affordable units, particularly those that are always affordable, are federally assisted units. Table 3-10 reports our calculations of the number of assisted rental units – public housing and privately-owned projects – for each survey year from 1985 to 2013. From this table, we calculate that assisted projects provided 95.5 million unit years of affordable rental housing. This is 17.8 percent of the total number of unit years of affordable housing from 1985 through 2013, as

⁴³ In setting up this taxonomy, we put units that were rental for all but one year and that were temporarily out of the stock for that year in category 3. This made category 2 the repository of affordable units with one blip to moderate and category 3 the repository of affordable units with one blip to something else. In defining categories, 7 through 10, we put units that were always rental except for periods when they were temporarily out of the stock into the always rental categories, 7 and 8.

reported in Table 4-2. We also calculate that there were about 2.7 million assisted units that were always in the affordable rental stock; these units comprise 81 million unit years, about 84.8 percent of the 95.5 million unit years provided by assisted public and private projects. These units also provided about 76.1 percent of the unit years provided by units that were always affordable (category 1 in Table 4-7), and about 65.7 percent of the unit years provided by units that were always affordable or almost always affordable (Table 4-8). This is a substantial role in the affordable rental housing stock.

As discussed in Chapter 3, most of the units we identified as federally assisted are those that were in subsidized housing projects built prior to 1985. There were a limited number of federally assisted project constructed after 1985. Of the 3,514,00 of assisted housing, 322,000 were new to the stock after 1985. An important consideration is the 1.6 million units put into service over this period under the low income housing tax credit program, which was instituted in 1986. These units are targeted at a somewhat higher income group but might be affordable at 50 percent of median income, the criterion used to define affordable in this study. The most recent analysis of the LIHTC projects placed in service between 2006 and 2014 calculated that 9.3 percent of the projects had elected the 50 percent of area median income criterion; the other 90.7 percent elected the 60 percent criterion.⁴⁴

While federally-assisted units are a relatively small segment of the inventory, their role in supporting affordable rental housing is important.

The Role of Units That Filter and Gentrify

The analysis in Chapter 3 comparing the beginning and end of the period showed that the movement of rental units across affordability categories is widespread. While both filtering – movement from a higher rent to a lower rent status – and gentrification – movement from a lower rent to a higher rent status – are commonplace, filtering dominated gentrification so that the net change from the two processes was the major source in the increase in the number of affordable rental units between 1985 and 2013. The previous chapter also showed that movement across rental categories is rarely smooth. Categories 4, 5, and 6 in Table 4-7 confirm these findings from the perspective of the history of affordable rental housing throughout the 28-year period.

For category 4, column A counts the number of units that were always rental but never affordable. The total (3.3 million) represents only 18.1 percent of the units that were always rental (categories 1, 2, and 4 through 8). The overwhelming majority of rental units were affordable at least sometime during this period.

Category 5 counts rental units that were initially not affordable but finished the period as affordable and that had a “smooth” filtering experience. We define smooth using the mathematical term “monotonic.” As discussed in Chapter 3, the adverb “monotonically” means

⁴⁴ U.S. Department of Housing and Urban Development, “National Low Income Housing Tax Credit (LIHTC) Database: Projects Placed in Service through 2014,” p. 13.

that there was never a movement from a lower rent status to a higher rent status. For example, a unit may have started out as a high rent unit and then filtered down to a moderate rent unit and finally filtered down to an affordable rent unit. To filter monotonically, once the unit in this example achieved moderate status, it never again became a high rent unit; and, once it achieved affordable status, it never again became either moderate or high rent. Chapter 3 showed that 13.9 percent of all the affordable rental units in 2013 that came from higher rent categories in 1985 filtered smoothly. Category 6 counts rental units that were initially affordable but finished the period as not affordable and that had a “smooth” gentrifying experience. Here monotonically means that there was never a movement from a higher rent status to a lower rent status.

Column A of Table 4-7 showed that almost three times as many units experienced smooth filtration as experienced smooth gentrification. Combined the two categories account for slightly less than 1.0 percent of all units and 10 percent of units that were always rental. They accounted for 3.3 percent of the affordable rental housing over the period.

The differences between filtering and gentrifying units in columns F, G, and H are interesting. Column F shows that units that filtered were affordable rental for about 12½ years – the years from 2000 or 2001 to 2013. Units that gentrified provided affordable rental housing for their first 9 ½ years in the inventory. Column G indicates that the average unit that gentrified smoothly was providing housing for 17.71 years whereas the average unit that filtered smoothly furnished housing for 23.19 years, implying that the average gentrifying unit entered the inventory around 1995 and the average filtering unit around 1990. Column G also implies that a higher proportion of gentrifying units than filtering units entered the stock after 1985, since units that are temporarily or permanently out of the stock are not in categories 5 and 6. Column H records that units in both categories spent slightly more than half of their time as affordable units. Looking just at categories 5 and 6, one would conclude that the movement across rental statuses favors affordable housing both in terms of the number of units that moved down compared to those that moved up and in terms of the number of years spent as affordable before a move up and after a move down. However, the number of units involved is small and the number of unit years of affordable rental housing is modest.

The Contribution of Units That Were Only Occasionally Affordable

Categories 7 and 8 include units that were always rental and occasionally affordable but where there was no smooth filtering or gentrifying. These categories represent 8.9 percent of the housing stock and combined they contributed 16.6 percent of the unit years of affordable housing over the 30-year period.

Several interesting facts stand out in Table 4-7 about the units in categories 7 and 8. Units in both categories are always rental but only occasionally affordable. Category 7 units were affordable in at least half the surveys that were in the AHS sample whereas category 8 units were affordable at least once, but in less than half the surveys.⁴⁵ We chose “half” as a convenient dividing line before examining the data. After examining the data, we found that the

⁴⁵ Units that were always rental but never affordable are included in category 4.

average behavior in the two categories is much different than half. Our measure of consistency, column H, indicates that the average category 7 unit was affordable for 69 percent of its time in the housing stock while the average category 8 unit was affordable only 20 percent of its time in the stock.

The category in Table 4-7 that made the largest contribution (24.4 percent) to the unit years of affordable housing was the group of units (category 10) that were not always rental and that were affordable rentals less than half of their time in the stock during the period.⁴⁶ This group furnished more unit years of affordable rental housing than even the “always affordable” group. Of course, this is a very large category; it includes 44.4 million units, 28.5 percent of all units. Affordable rental housing accounted for only a small portion of the time these units spent in the housing stock over this period. On average, these units provided housing for 26.48 unit years, of which only 2.94 unit years were as affordable rental units. From the perspective of promoting affordable housing, this presents a conundrum; almost a quarter of the affordable rental housing comes from units that are affordable only 11 percent of the time and that are not strictly – indeed, not usually – rental units.

A relatively small number of units, while not always rental, are affordable rentals at least half of the time. The 5.8 million units in category 9 constitute only 3.7 percent of the housing stock but provide 19.1 percent of the affordable rental housing. Their contribution is the third largest, after the contributions of category 10 and category 1 -- units that are not always rental but provide affordable rental housing less than half the time and the group of “always affordable” units. On average, these units provided housing for 26.24 unit years, of which 17.77 unit years were as affordable rental units. What makes these units so interesting is the combination of not being always rental, yet spending almost 70 percent of their career as affordable rentals, and being the third most important source of affordable rental housing.

A fascinating question is whether it is possible to convert some of the units in category 8 or 10 into category 7 or 9 units. The last part of this section looks at the characteristics of units that provide affordable housing to assist in the identification of both rental and non-rentals that furnish affordable rental housing in a “roughly consistent” manner.

Distinguishing among Occasionally Affordable Units

This remainder of this section investigates whether there are characteristics that would help those interested in preservation differentiate the 8.6 million units in categories 7 and 9 that furnish affordable housing on a roughly consistent basis from the 50.5 million in categories 8 and 10 that provided it only rarely. We look at type of structure, age of structure, and unit size – the factors we examined earlier in the chapter in looking for sources of affordable housing. We also assess whether there are locational differences among these four categories.

Table 4-9 uses these factors to distinguish units in categories 7 from those in category 8 and units in category 9 from those in category 10. Units in 2-to-4 unit structures appear much

⁴⁶ Units in category 10 may have never been affordable rental.

more frequently in category 7 compared to category 8 and in category 9 compared to category 10. Category 7 units are less likely than category 8 units to be in structures with 20 or more units.

Table 4-9. Comparison of Unit and Location Characteristics of Units That Are Affordable More or Less than Half Their Time in the Housing Stock

	Always rental, at least half affordable	Always rental, less than half affordable	Not always rental, at least half affordable	Not always rental, less than half affordable
Location				
In central cities	48.5%	48.0%	43.2%	33.1%
Urban suburbs	31.6%	39.3%	20.7%	32.6%
Rural suburbs	4.7%	4.4%	9.7%	10.9%
Urban non-metro	10.5%	6.1%	10.4%	9.0%
Rural non metro	4.7%	2.3%	15.9%	14.3%
Structure Type				
Mobile home	1.4%	0.2%	8.2%	7.7%
Single-family detached	8.2%	6.5%	33.7%	58.3%
Single-family attached	3.5%	4.3%	6.1%	7.4%
2-4 unit structure	32.4%	22.9%	25.1%	9.4%
5-9 unit structure	19.7%	21.4%	10.5%	4.5%
10-19 unit structure	17.2%	20.2%	7.1%	4.4%
20-49 unit structure	11.0%	14.8%	4.8%	3.5%
50 or more unit structure	6.7%	9.7%	4.5%	5.0%
All 5+ unit structures	54.6%	66.1%	26.9%	17.3%
Age of structure				
1949 and earlier	27.4%	18.8%	44.8%	26.8%
1950-1969	23.7%	21.3%	19.5%	22.6%
1970-1989	42.1%	43.4%	26.1%	32.9%
1990-2013	6.7%	16.5%	9.7%	17.7%
Number of bedrooms				
0	2.3%	2.2%	4.6%	1.1%
1	37.1%	35.7%	25.1%	11.2%
2	47.8%	49.7%	40.1%	32.9%
3	11.6%	10.8%	25.0%	42.3%
4	1.1%	1.4%	4.0%	10.5%
5	0.1%	0.1%	1.0%	1.7%
6 or more	0.0%	0.0%	0.2%	0.3%
Small metros and nonmetro by region				
North East	5.3%	4.2%	8.3%	6.0%

Midwest	13.0%	5.1%	16.7%	10.1%
South	14.7%	12.7%	24.8%	24.7%
West	9.3%	8.5%	9.2%	10.7%
Identified metros	57.7%	69.5%	41.1%	48.5%

Units built prior to 1950 were much more likely to provide affordable rental housing among both units that were always rental and units that were sometimes non-rental, while units built after 1990 were much less likely for both groups. Among units that were occasionally non-rental, one-bedroom and two-bedroom units were much more likely and three-bedroom were much less likely to provide affordable rental housing.

There were also some large differences based on location. Among units that are always rental, the units that are usually affordable are less concentrated in urban suburbs; they are also more concentrated in the Midwest. The same patterns appear among units that are sometimes non-rental.

As noted in Chapter 3, the AHS identifies the larger metropolitan areas, if they are included in the sample, but suppresses this information for the smaller metropolitan areas. The last row in Table 4-9 indicates that, for both groups, the usually affordable units are less concentrated in these larger metropolitan areas. These locational differences indicate that preserving the available affordable housing may be a more urgent concern in larger metropolitan areas.

Affordable Housing Provided by Permanent Losses

Table 4-7 shows that those units which permanently left the stock sometime between 1985 and 2013 – those in Category 11 - served as an important source of affordable rental housing. On average, they left the stock in 1995. Nonetheless, they furnished 64.6 million unit years of affordable housing, 12.1 percent of the total unit years of affordable rental housing. Thirty percent of their limited time in inventory was spent as affordable rentals; this was twice the percentage attributed to all units.

Category 11 includes 20.8 million units; of these, 14.6 million were either in the housing stock in 1985 or existed but were temporarily out of the stock in 1985. The remaining 6.2 million were added to the housing stock after 1985 but left the stock permanently prior to 2013. The methodological discussion in Chapter 2 explained that units can leave the stock permanently in various ways. As discussed there, the most common way – demolition or destruction by fire or natural disaster – involves the loss of physical capital. Other ways – the movement of mobile homes and, more rarely, houses – involve the loss of physical capital at a particular location. And still other ways – the merger of two units into one or the splitting of one unit into multiple units – involve a radical transformation of physical capital. We will examine the contributions to affordable rental housing of those units that left the stock permanently distinguishing first by whether the unit was in the 1985 stock or not and then by the way the unit left the stock.

Table 4-10 disaggregates category 11 into those units that were in the housing inventory or temporarily out of it in 1985, and those that were added to the stock after 1985. It also calculates the average number of years spent in each housing status and the percentage of years in the housing stock by status.

The housing histories of these two groups differ systematically from that of all units studied and from each other. Both permanent loss groups were less likely to have served as owner stock and more likely to have served as rentals or seasonal units. For all units, the percentage of time spent on average in the owner stock was 60 percent compared to only 37 percent for the “in 1985” group and 48 percent for the “added” group. All units, on average, spent 7 percent in the seasonal/second home status whereas, among permanent losses, the “in 1985” group spent 17 percent and the “added” group spent 22 percent.

Table 4-10. Unit Years for Permanent Losses by Whether the Unit Existed in 1985 or Was Added after 1985

	In 1985 stock			Added after 1985		
	Unit Years (in millions)	Average per unit	Percent of "Time in Stock"	Unit Years (in millions)	Average per unit	Percent of "Time in Stock"
Not in sample	0.0	0.00	0	61.1	9.92	
Affordable	57.0	3.90	30.9%	7.5	1.22	18.3%
Moderate	22.7	1.55	12.3%	3.7	0.60	9.0%
High	5.9	0.40	3.2%	1.3	0.21	3.1%
All rentals	85.6	5.86	46.3%	12.5	2.04	30.4%
Owner	67.9	4.64	36.7%	19.7	3.20	47.8%
Seasonal/URE	31.3	2.14	17.0%	9.0	1.47	21.9%
Housing Stock	184.8	12.64	100.0%	41.3	6.71	100.0%
Temporary loss	28.5	1.95		4.8	0.78	
Permanent loss	225.2	15.41		77.5	12.59	
Number of units	14,616,000			6,156,000		

Table 4-11 breaks category 11, permanent losses, down into the various ways that a unit can become a permanent loss. It shows that 38.1 percent of permanent losses are due to demolitions or destruction by fire or natural disaster. The movement of mobile homes and houses comprised 26.4 percent. The only other category with a substantial percentage is the catch-all category called “other” which accounted for 22.2 percent of the permanent losses. The splitting of a unit into multiple units (conversions) and the merging of one or more units represent only 7.5 percent combined.

The patterns of usage over the 30 years differ substantially by the type of loss. Those units that were lost through demolition or by natural disasters spent nearly half of their time as rental units, including 32.6 percent as affordable rentals. One might expect disaster losses to be

Table 4-11. Unit Years and Related Information for Permanent Losses by Type of Loss

(unit years in millions)	Demolition or disaster loss	Mobile home or house moved	Unit eliminated in structural conversion	Unit Merged	Other	Total
Not in sample	8.9	27.7	1.4	3.9	17.0	58.9
Affordable	33.6	7.1	3.4	5.2	12.4	61.7
Moderate	12.6	1.9	1.7	2.6	6.3	25.1
High	2.7	0.4	0.5	0.8	2.3	6.7
All rentals	48.9	9.4	5.5	8.6	21.0	93.5
Owner	35.7	26.2	1.4	3.3	17.0	83.6
Seasonal	18.5	7.7	0.9	1.6	10.0	38.6
Housing Stock	103.1	43.3	7.8	13.4	48.0	215.7
Temp loss	12.8	5.1	2.0	1.1	10.7	31.7
Perm loss	112.4	88.1	5.2	12.3	62.9	280.9
Total unit years	237.3	164.2	16.5	30.8	138.5	587.3
Number of units (in thousands)	7,910	5,474	550	1,026	4,616	20,771
Percent of lost units	38.1%	26.4%	2.6%	4.9%	22.2%	
Average years per unit						
Not in sample	1.13	5.06	2.60	3.77	3.67	2.83
Affordable	4.25	1.30	6.10	5.07	2.69	2.97
Moderate	1.59	0.34	3.10	2.53	1.37	1.21
High	0.34	0.08	0.85	0.78	0.50	0.32
All rentals	6.19	1.72	10.04	8.38	4.55	4.50
Owner	4.51	4.79	2.58	3.19	3.68	4.03
Seasonal	2.34	1.41	1.62	1.54	2.16	1.86
Housing Stock	13.04	7.92	14.24	13.11	10.40	10.39
Temp loss	1.62	0.93	3.70	1.09	2.31	1.53
Perm loss	14.22	16.09	9.46	12.04	13.62	13.53
Percent of years in stock						
Affordable	32.6%	16.4%	42.8%	38.6%	25.9%	28.6%
Moderate	12.2%	4.3%	21.7%	19.3%	13.1%	11.6%
High	2.6%	1.0%	5.9%	6.0%	4.8%	3.1%
All rentals	47.5%	21.7%	70.5%	63.9%	43.8%	43.3%
Owner	34.6%	60.6%	18.1%	24.3%	35.4%	38.8%
Seasonal	17.9%	17.8%	11.4%	11.7%	20.8%	17.9%

spread randomly over the entire housing stock and, therefore, it may seem strange that this category has a higher than average proportion of unit years as rentals and as affordable housing. This group includes both disaster losses and demolitions. The decision to demolish a residential structure is a market driven decision. Apparently serving as rental stock is a common step on the path out of the housing stock. Economic factors also play an important factor in disaster losses. If a fire or natural disaster does not completely destroy a unit, the owner has to decide whether to repair it or demolish it. Lower quality units will more likely be demolished instead of rebuilt.

Losses due to mergers and conversions also seem to be heavily concentrated among rental units. On average, they were rental units for two-thirds of their time in inventory, and affordable rental units for 40 percent of the time. Once again serving as affordable rental housing on the way out of the inventory appears to be common for those units that left the inventory during this period but, for these units, the “way out” involves a transformation rather than a loss of physical capital.

The exception to these patterns was the losses due to the relocation of units, which as previously noted means primarily the relocation of mobile homes. Only 22 percent of the time in inventory of these units was as rentals, but for 16 of that 22 percent they were affordable rentals.

Units which are demolished or lost through disaster, and even more those lost through structural conversion or merger, are predominantly rental units, and usually affordable rental units. Units lost because they were moved to another location are predominantly in the owner stock. As a whole, units that became permanent losses furnished 6.4 percent of the unit years of housing from 1984 to 2013, but 12.1 percent of the affordable rental housing over that period.

Affordable Housing Provided by Additions to the Stock

New units come into the stock in a variety of ways. New construction accounts for 67.2 percent of the additions tracked by the AHS between 1985 and 2013. Other ways include the movement of mobile homes or houses to a new location; the creation of a new unit through the splitting up of an old unit or the merging of two or more older units; and the conversion of a non-residential structure, such as a warehouse, into housing units. Table 4-12 shows the unit years by type of housing created from additions between 1985 and 2013; it distinguishes between units added by new construction and units added by other means.

Over the 30-year period, additions to the housing stock furnished 24.7 percent of the total unit years of housing. This included 67.6 million unit years of affordable rental housing, which was 12.6 percent of all the unit years of affordable rental housing. On average, units added both through new construction spent approximately 15 years in the housing inventory, units added by other means spent approximately 13 years.

With the exception of length in inventory, there were marked differences in the role played by newly constructed units compared to units added in other ways. Units added by other means spent a substantially larger share of their time in the stock as rentals (31.4 percent vs. 23.8

percent) and as affordable rentals (14.5 percent vs. 6.4 percent). They were also more likely to serve as seasonal units and more likely to have become permanent losses.

While losses have a much higher proportion of time in inventory as affordable rentals than additions, additions accounted for more unit years of affordable rental housing because there were 52.8 million additions and 20.8 million losses.

Table 4-12. Unit Years of Housing and Related Information by Type of Addition

(unit years in millions)	Added by new construction	Added by other means	All additions
Not in sample	506.7	215.3	722.0
Affordable	34.6	33.0	67.6
Moderate	59.8	25.8	85.6
High	33.7	12.7	46.3
All rentals	128.1	71.4	199.5
Owner	378.5	126.4	504.9
Seasonal	32.6	29.6	62.2
Housing Stock	539.2	227.4	766.6
Temp loss	2.2	15.9	18.2
Perm loss	15.9	61.6	77.5
Total unit years	1,064.1	520.2	1,584.3
Number of units (in thousands)	35,471	17,339	52,810
Percent of units	67.2%	32.8%	100.0%
Average years per unit			
Not in sample	14.29	12.42	13.67
Affordable	0.98	1.90	1.28
Moderate	1.69	1.49	1.62
High	0.95	0.73	0.88
All rentals	3.61	4.12	3.78
Owner	10.67	7.29	9.56
Seasonal	0.92	1.70	1.18
Housing Stock	15.20	13.11	14.52
Temp loss	0.06	0.92	0.34
Perm loss	0.45	3.55	1.47
Percent of years in stock			
Affordable	6.4%	14.5%	8.8%
Moderate	11.1%	11.3%	11.2%
High	6.2%	5.6%	6.0%
All rentals	23.8%	31.4%	26.0%
Owner	70.2%	55.6%	65.9%
Seasonal	6.0%	13.0%	8.1%

Conclusions

On a national level, affordable rental housing constituted about 15 percent of the housing stock between 1984 and 2013. This average represented conditions nationally throughout the period.

Units differ in size, age, type of structure, and other features. These features affect the amount of affordable rental housing that a unit is likely to provide in its lifetime. Single-family detached structures, 2-to-4 unit structures, and 5-to-9 unit structures provided 63.6 percent of all affordable housing during this period. Structures built before 1970 provided 61.1 percent of all affordable housing and units with one or two bedrooms provided 84.9 percent of all affordable housing. Units in most of these categories spent on average a higher proportion of their time in inventory as affordable housing than the typical unit. The exceptions are single-family detached structures, and, to a very slight degree, units built between 1950 and 1969.

The composition of the 2013 housing stock by structure type was almost identical to its composition at the beginning of the period studied. There was a smaller percentage of units in 2-to-4 unit structures in 2013, an important source of affordable housing, but this statistically significant decline was small. The 2013 stock contains a smaller percentage of two-bedroom units than the 1985 stock did. In this respect, the 2005 stock is not as well situated to provide affordable rental housing in the future.

Affordable rental housing is an acknowledged policy objective at the national level. The federal government promotes affordable housing through such tools as the housing choice voucher program, the continued support of public housing and privately-owned assisted housing projects, including preservation of privately-owned projects and rehabilitation of some public housing through HOPE VI, and the low income housing tax credit. At the local level, public and private efforts focus on the preservation of affordable rental housing. The experience of the period from 1984 through 2013 shows that there is a segment of the rental housing stock that is consistently affordable and preservation of these units would advance this policy objective.

One important dimension of preservation activity has been efforts to prevent the loss of affordable units in federally assisted housing through demolition or the conversion to market-rate housing. This chapter has documented that the public housing stock and the inventory of privately-owned, federally assisted projects combined to contribute 12.5 percent of the unit years of affordable rental housing, and almost half of the unit years of those units that were always affordable or almost always affordable.

Local activity has also focused on preserving buildings that have historically provided affordable rental housing. This chapter has documented that 2.5 million non-federally assisted units furnished affordable housing on an always or almost always basis. These units and federally assisted units are generally easy to identify at the local level.

Finally, this chapter has documented that there were 5.2 million units that provided affordable rental housing on a consistent basis; 4.0 million were always rental and 1.2 million

were sometimes non-rental. These latter units spent over 90 percent of their time in inventory as affordable rentals. Combined, these 5.2 million units provided 131.8 million unit years of affordable rental housing, 24.6 percent of the total. In addition, there were 8.6 million units that were affordable at least half the time they were in the housing inventory; indeed, on average these units provided affordable housing at least two-thirds of the time. From a preservation perspective, the payoff from preserving these units could be substantial. At the same time, however, there were 50.5 million units that also provided affordable rental housing but not on a consistent basis; they spent 10 to 20 percent of their time in inventory as affordable rental housing. While these units resemble the 7.3 million on a superficial level, they spent only 10-15 percent of their time in inventory as affordable rentals. Their combined contribution was an impressive 163.8 million unit years of affordable housing, 30.6 percent of the total. Nevertheless, their on-again/off-again performance as affordable rentals indicates to us that preserving these units would produce little payoff for the costs and efforts involved.

Preserving units that have provided affordable rental housing for most of their recent history makes good sense because experience indicates that these units will continue to provide affordable housing. Targeting for preservation units in 2-to-4 unit structures and units built before 1970 also makes sense because affordable rental housing was concentrated in units with these characteristics over the period from 1984 through 2013. On the other hand, affordable rental housing was less concentrated in units built after 1985 and units located in buildings containing 20 or more units. Among units that were occasionally non-rental, one-bedroom and two-bedroom units are good candidates for preservation. The location analysis suggests that preservation may be a more urgent concern in large metropolitan areas.

Appendix to Chapter 4: Multivariate Analysis

In Chapters 3 and 4, we explore the relationships between certain unit characteristics and the provision of affordable rental housing. Here we use multivariate analysis to test whether the conditions that appeared to favor or limit affordability act independently and to derive a clearer picture of the relationships.

Our independent variables are categorical. The groupings and the number of categories in each group were: region (4), metropolitan/nonmetropolitan status (5), structure type (8), year built (15), number of bedrooms (6), whether the unit was in an identified SMSA (2) and whether the unit is assisted (2).

Because the count of bedrooms for a sample unit can vary from survey-to-survey, we used our computation of the modal number of bedrooms reported and, if there were multiple modes, we chose the mode representing the largest number of bedrooms. Infrequently there can be variation in the type of structure reported. For this reason, we use the most recently reported structure type.⁴⁷ Similarly, we use the most recently reported year built. The year built variable can change between surveys for two reasons, reporting errors or major modifications to the structure that cause the respondent to believe that the more recent date is the more accurate answer to the question. We chose the most recent answer because major modifications are likely to be strongly related to how the structure serves the housing market. This choice explains why, in the regressions based on the 1985 stock, there are cases with year built after 1985.

In the regressions reported here, the base case (the omitted categories) was: South, central city, single-family detached, built 1975-1979, two bedrooms, not in an identified SMSA, and unassisted.

1. Analysis of conditions related to affordability

We used proportional logit to determine which variables are related to the proportion of time a unit provides affordable housing. In regular logit, one models a binary event -- a unit is affordable or not affordable. What we want to model is the proportion of time a unit is an affordable rental once it enters the sample -- the numerator is the number of surveys in which a unit was affordable and the denominator is the number of years surveyed (this includes surveys in which the unit was temporarily or permanently out of the stock).

We omitted assisted housing units from this analysis. We report weighted results but, to prevent skewing the estimates of statistical significance, we adjusted the weights so that were approximately equal to the number of cases in the analysis.

⁴⁷ If a unit is split into two or more units or merged with another unit, the AHS considers the unit a permanent loss and drops the unit from the sample. Therefore, there should be no change in the type of structure variable.

Logit estimates the impact of variables on the odds ratio. It uses the natural logarithm of the ratio of the probability of an event (p) divided by the probability of not the event (1-p), or $\ln(p/(1-p))$.

The proportional logit analysis was highly significant with a likelihood ratio < 0.0001 and all the coefficients were significant 0.0001 level, except for the coefficient of the coefficient of efficiency (zero bedroom) units, which was significant at the 0.0002 level. Our use of panel data (treating each unit as a series of observations) in this regression may result in overestimates of "significance". This concern only applies to the proportion logit in this section and does not apply to the regular logits in the remaining five sections.

The base case estimate of the proportion of years affordable is 12.4 percent, for unassisted units that were in the sample all 30 years (two-thirds of all unassisted units) The average time as an affordable unit was 3.7 years.

Table 4A-1 shows the impact on the base case proportion of changing each variable.

Table 4A-1: Effect of Unit Characteristics on Proportion of Years Affordable⁴⁸

Category – change in base case	Proportion of Years Affordable	Change from base case
Northeast	7.5%***	-4.8%
Midwest	14.7%***	2.3%
West	9.9%***	-2.4%
Urban suburb	9.5%***	-2.9%
Rural suburb	8.9%***	-3.5%
Urban non-metro	9.1%***	-3.3%
Rural non-metro	9.1%***	-3.3%
Mobile home	17.4%***	5.0%
Single-family attached	24.6%***	12.2%
2-4 unit structure	41.3%***	28.9%
Structure with 5-9 units	42.7%***	30.3%
Structure with 10-19 units	40.1%***	27.7%
Structure with 20-49 units	36.7%***	24.3%
Structure with 50+ units	26.6%***	14.2%
Built before 1920	18.1%***	5.7%
Built 1920-1929	18.8%***	6.4%

⁴⁸ The SAS© logit program tests whether the coefficients from the log likelihood calculations are statistically different from zero. In this Table, we translated those coefficients into proportion estimates and then subtracted the proportion of the intercept (base case). In the Table, we report the results of the statistical test of the coefficients. These are not tests of either the proportion calculations or of the differences in proportions.

Built 1930-1939	19.2%***	6.9%
Built 1940-1949	17.3%***	4.9%
Built 1950-1959	14.0%***	1.6%
Built 1960-1969	13.2%***	0.8%
Built 1970-1974	11.6%***	-0.8%
Built 1980-1984	7.4%***	-4.9%
Built 1985-1989	6.3%***	-6.0%
Built 1990-1994	6.6%***	-5.8%
Built 1995-1999	6.2%***	-6.2%
Built 2000-2004	7.4%***	-4.9%
Built 2005-2009	6.9%***	-5.5%
Built 2010-2013	6.2%***	-6.1%
Zero bedrooms	13.3%***	0.9%
One bedroom	14.4%***	2.0%
Three bedrooms	8.1%***	-4.3%
Four bedrooms	5.6%***	-6.7%
Five + bedrooms	6.1%***	-6.2%
In identified SMSA	8.0%***	-4.4%

***Significant at <0.0001

The proportion of time as affordable rental housing was lower for units in the Northeast and West and slightly higher in the Midwest. The proportion was highest for units in central cities; outside of central cities there was little variation by location. Compared to single family detached structures, the proportions of time spent as affordable rental housing were higher in all the alternative structure types and were particularly higher among small multiunit structures. Generally, the proportions fell with age of structure. Units in structures built before 1970 had higher proportions than the base case units while those built after 1970 had lower proportions. Small units (efficiencies and one-bedrooms) had higher proportions whereas large units (three or more bedrooms) had lower proportions. Units in larger metropolitan areas had lower proportions.

Estimated average proportions varied among the groups studied from a high of 65 percent (one bedroom units in 5-9 unit structures built in the 1930s and located in smaller central cities in the Midwest) to a low of 1 percent (four-bedroom single family detached structures built between 1995 and 1999 in a rural suburban part of a large metropolitan area in the West).

2. Analysis of conditions related to permanent loss of affordable units

We used logit analysis to see what unit characteristics are associated with affordable units being permanently lost from the housing stock. We studied those units that were affordable

rental in 1985. There were 6,385 units affordable in 1985; of which, 1,687 had become permanent losses by 2013.

We used the same independent variables as the previous regression with the addition of the assisted housing variable. We dropped the category “built between 2010 and 2013” because it contained no losses. The base case was South, central city, single-family detached, built 1975-1979, two bedrooms, unassisted, and not in an identified SMSA. Again, we reported the weighted results using weights adjusted to sum to the number of cases.

The logit analysis was highly significant with a likelihood ratio < 0.0001 but not all of the variables are statistically significant.

From the logit results we compute the probability of becoming a permanent loss. The base case probability is 12.7 percent. Table 4A-2 shows how changing the base case effects the probability.

Table 4A-2: Probability that a 1985 affordable rental will become a permanent loss⁴⁹

Category – change in base case	Probability of permanent loss	Change from base case
Northeast	5.6%***	-7.1%
Midwest	7.5%***	-5.2%
West	6.8%***	-5.9%
Urban suburb	11.5%	-1.1%
Rural suburb	17.5%**	4.8%
Urban non-metro	14.0%	1.3%
Rural non-metro	15.8%*	3.1%
Mobile home	65.8%***	53.1%
Single-family attached	19.2%**	6.5%
2-4 unit structure	14.1%	1.4%
Structure with 5-9 units	13.7%	1.0%
Structure with 10-19 units	12.6%	0.0%
Structure with 20-49 units	10.0%	-2.7%
Structure with 50+ units	8.7%*	-3.9%
Built before 1920	39.1%***	26.4%
Built 1920-1929	36.2%***	23.5%
Built 1930-1939	40.1%***	27.5%
Built 1940-1949	38.2%***	25.5%

⁴⁹ The SAS© logit program tests whether the coefficients from the log likelihood calculations are statistically different from zero. In this Table, we translated those coefficients into probability estimates and then subtracted the probability of the intercept (base case). In the Table we report the results of the statistical test of the coefficients. These are not tests of either the probability calculations or of the differences in probabilities.

Built 1950-1959	34.2%***	21.5%
Built 1960-1969	21.0%***	8.3%
Built 1970-1974	16.0%	3.4%
Built 1980-1984	6.8%**	-5.9%
Built 1985-1989	6.9%	-5.8%
Built 1990-1994	2.8%	-9.9%
Built 1995-1999	1.2%**	-11.5%
Built 2000-2004	1.6%**	-11.1%
Built 2005-2009	4.5%	-8.1%
Zero bedrooms	29.3%***	16.7%
One bedroom	15.6%**	2.9%
Three bedrooms	13.0%	0.3%
Four bedrooms	16.6%*	3.9%
Five + bedrooms	16.4%	3.7%
In identified SMSA	15.3%**	2.6%
Assisted	7.5%***	-5.1%

* Significant at 0.05 level

** Significant at 0.01 level

***Significant at <0.0001

Affordable rentals in the Northeast, Midwest, and West are less likely to become permanent losses but units in rural areas are more likely, in both metropolitan and nonmetropolitan setting. Affordable rentals in single-family attached structures are more likely to become permanent losses. Not surprisingly, older (built before 1970) affordable units are more likely to be lost and some categories of newer units are less likely. Efficiencies are more likely, whereas four bedroom units are less likely. Units located in the larger metropolitan areas are more likely. Assisted units are less likely.

3. Conditions associated with filtration, 1985 vs. 2013

We used logit analysis to identify unit characteristics associated with a long-term change in affordability of rental units. We analyzed 8,428 units that were moderate or high rent in 1985, of which 23.8 percent had become affordable by 2013. (Many of these were no longer rental in 2013.)

The variables and the base case were the same as those in the permanent loss regression, except we omitted the assisted variable because none of the units by definition were assisted. Again, we reported the weighted results using adjusted weights.

The logit analysis was highly significant with a likelihood ratio < 0.0001, but just over half of the variables are statistically significant (18 of 34). Twelve of the 14 year built variables are not significant. Nearly all of the other variables (16 of 20) are significant.

From the logit results we compute the probability of becoming affordable in 2013. The base case probability is 23.9 percent. Table 4A-3 shows how the variables effect the base case probability.

Table 4A-3: Probability of a Moderate or High Rent Unit in 1985 Being Affordable in 2013⁵⁰

Category – change in base case	Probability of being affordable in 2013	Change from base case
Northeast	18.2%***	-5.6%
Midwest	37.0%***	13.1%
West	17.3%***	-6.6%
Urban suburb	21.2%**	-2.7%
Rural suburb	12.6%***	-11.3%
Urban non-metro	20.2%	-3.7%
Rural non-metro	14.0%**	-9.8%
Mobile home	17.1%	-6.7%
Single-family attached	27.0%	3.2%
2-4 unit structure	46.5%***	22.6%
Structure with 5-9 units	44.9%***	21.0%
Structure with 10-19 units	44.1%***	20.2%
Structure with 20-49 units	45.2%***	21.4%
Structure with 50+ units	32.4%**	8.5%
Built before 1920	19.4%*	-4.5%
Built 1920-1929	20.0%	-3.8%
Built 1930-1939	19.0%*	-4.9%
Built 1940-1949	20.6%	-3.3%
Built 1950-1959	24.3%	0.4%
Built 1960-1969	23.2%	-0.6%
Built 1970-1974	23.2%	-0.7%
Built 1980-1984	20.5%	-3.3%
Built 1985-1989	19.3%	-4.6%
Built 1990-1994	17.1%	-6.7%
Built 1995-1999	13.0%	-10.9%
Built 2000-2004	17.5%	-6.4%
Built 2005-2009	0.0%	-23.9%
Built 2010-2013	0.0%	-23.9%

⁵⁰ The SAS© logit program tests whether the coefficients from the log likelihood calculations are statistically different from zero. In this Table, we translated those coefficients into probability estimates and then subtracted the probability of the intercept (base case). In the Table, we report the results of the statistical test of the coefficients. These are not tests of either the probability calculations or of the differences in probabilities.

Zero bedrooms	17.0%**	-6.9%
One bedroom	23.6%	-0.3%
Three bedrooms	16.2%***	-7.7%
Four bedrooms	14.4%**	-9.5%
Five + bedrooms	16.1%	-7.8%
In identified SMSA	17.4%***	-6.4%

* Significant at 0.05 level

** Significant at 0.01 level

***Significant at <0.0001

Compared to the South, long-term filtration was more likely to occur the Midwest but less likely to occur in the Northeast and the West. Compared to central cities, it was less likely to occur in suburbs and the rural parts of nonmetropolitan areas. Long-term filtration was more likely to occur among units in multiunit structures. Age of structure had little impact on long-term filtration; the only statistically significant coefficients indicated that it was less likely to occur in unit built before 1920 and units built in the 1930s. Compared to two bedroom units, long-term filtration was less likely to occur among efficiencies and three and four bedroom units. Long-term filtration was also less likely to occur in large metropolitan areas.

4. Conditions associated with a unit being strictly owner stock or occasionally rental

We used logit analysis to learn whether unit characteristics are associated with a unit being always part of the owner stock or occasionally part of the rental stock. We studied 39,787 units, 22,123 of which (55.6 percent) were always owner stock and 17,664 (44.3 percent) were sometimes in the owner and sometimes in the renter stock. The latter group could additionally be occasionally part of the URE/seasonal stock or temporarily out of the stock, but these units had to be owner stock at least once and renter stock at least once.

The variables and the base case were the same as those in the permanent loss regression, except we omitted the assisted variable because none of the units by definition were assisted. Again, we reported the weighted results using adjusted weights.

The logit analysis was highly significant with a likelihood ratio < 0.0001 and all but four of the variables are statistically significant.

The probability calculated is the probability of a unit being rental at least once. The base case category is a *two-bedroom* single family detached unit *that was at least once part of the owner stock* in a central city in the South (but not in an identified metropolitan area); the probability that this unit will be at least once a rental – is 67.0 percent. The italicized phrases are important in interpreting these results which show how a change in the characteristics of the units result in a higher or lower probability than the base case. The base case probability differs substantially from the overall pattern because we are dealing with owner units and a two-bedroom owner unit is unusual. As Table 4A-4 shows, the probability of a four-bedroom single-family detached unit in a central city in the South ever being rental is only 40.9 percent.

Table 4A-4. Probability of a unit being always part of the owner stock⁵¹

Category – change in base case	Probability of being rental at least once	Change over base case
North--east	47.1%***	-19.9%
Midwest	50.6%***	-16.4%
West	69.9%***	2.9%
Urban suburb	60.9%***	-6.1%
Rural suburb	57.8%***	-9.2%
Urban non-metro	67.6%	0.6%
Rural non-metro	62.9%***	-4.1%
Mobile home	83.2%***	16.2%
Single-family attached	82.7%***	15.7%
2-4 unit structure	95.5%***	28.5%
Structure with 5-9 units	94.9%***	27.9%
Structure with 10-19 units	95.7%***	28.7%
Structure with 20-49 units	93.9%***	26.9%
Structure with 50+ units	93.8%***	26.8%
Built before 1920	80.7%***	13.7%
Built 1920-1929	79.8%***	12.8%
Built 1930-1939	80.2%***	13.2%
Built 1940-1949	76.1%***	9.1%
Built 1950-1959	69.7%**	2.7%
Built 1960-1969	66.4%	-0.6%
Built 1970-1974	64.6%*	-2.4%
Built 1980-1984	65.0%	-2.0%
Built 1985-1989	58.7%***	-8.3%
Built 1990-1994	49.8%***	-17.2%
Built 1995-1999	43.1%***	-23.9%
Built 2000-2004	42.2%***	-24.8%
Built 2005-2009	37.4%***	-29.5%
Built 2010-2013	5.9%***	-61.1%
Zero bedrooms	94.3%**	27.3%
One bedroom	83.4%***	16.4%
Three bedrooms	51.5%***	-15.5%

⁵¹ The SAS© logit program tests whether the coefficients from the log likelihood calculations are statistically different from zero. In this Table, we translated those coefficients into probability estimates and then subtracted the probability of the intercept (base case). In the Table, we report the results of the statistical test of the coefficients. These are not tests of either the probability calculations or of the differences in probabilities.

Four bedrooms	40.9%***	-26.1%
Five + bedrooms	37.9%***	-29.1%
In identified SMSA	65.7%	-1.3%

* Significant at 0.05 level

** Significant at 0.01 level

***Significant at <0.0001

Given the consistent significance of the coefficients, we focus on the obvious patterns in the calculated probabilities. Units in the West are slightly more likely to be rental once compared to the South whereas units in the Northeast and Midwest are much less likely to be rental at least once. Compared to units in central cities, units in suburbs (and the rural part of nonmetropolitan areas) are less likely to be occasionally rental. Compared to single-family detached structures, units in every other kind of structure (that are at least once part of the owner stock) are more likely to be rental at least once. For the larger structures, we hypothesize that these are likely to be condominiums

The age of unit (year built) results are much easier to understand. The probability of being rental is higher for older units and lower for newer units and the probabilities decline almost monotonically. Having been owner at least once, the probability of being rental once is higher for smaller units.

5. Conditions associated with a not-always rental unit being affordable at least half the time⁵²

We used logit analysis to learn whether unit characteristics are associated with a unit that is not always rental being an affordable rental at least half of its time in the housing stock. This analysis focuses on the difference between categories 9 and 10 in Table 4-7. It is somewhat related to the analysis in section 4 above, in the following way: it includes all the units from that analysis that were sometimes owner and sometimes rental, but adds units that were sometimes rental and sometimes URE/seasonal and units that were sometimes rental and sometimes out of the stock.

We studied 21,057 units, all of which were rental at one time but not always rental, 2,419 of which were affordable at least half the time and 18,638 of which were affordable less than half the time.

⁵² The SAS© logit program tests whether the coefficients from the log likelihood calculations are statistically different from zero. In this Table, we translated those coefficients into probability estimates and then subtracted the probability of the intercept (base case). In the Table, we report the results of the statistical test of the coefficients. These are not tests of either the probability calculations or of the differences in probabilities.

The variables and the base case were the same as those in the permanent loss regression in Section 2, except that we omitted the assisted variable because none of the units, by definition, were assisted. Again, we reported the weighted results using the adjusted weights.

The logit analysis was highly significant with a likelihood ratio < 0.0001 and all but five of the variables are statistically significant. The base probability was 13.3 percent.

Table 4A-5 shows how changing the base case affects the probability of being affordable at least half the time.

Table 4A-5: Probability of being affordable at least half the time, if rental once but not always rental

Category – change in base case	Probability of being affordable at least half the time	Change over base case
Northeast	6.7% ***	-6.6%
Midwest	17.6% ***	4.3%
West	8.0% ***	-5.3%
Urban suburb	9.3% ***	-4.0%
Rural suburb	11.2% *	-2.1%
Urban non-metro	7.9% ***	-5.4%
Rural non-metro	12.2%	-1.1%
Mobile home	29.8% ***	16.5%
Single-family attached	25.9% ***	12.6%
2-4 unit structure	41.4% ***	28.1%
Structure with 5-9 units	41.9% ***	28.6%
Structure with 10-19 units	36.7% ***	23.4%
Structure with 20-49 units	29.3% ***	16.0%
Structure with 50+ units	19.9% **	6.6%
Built before 1920	21.4% ***	8.1%
Built 1920-1929	21.0% ***	7.7%
Built 1930-1939	21.7% ***	8.4%
Built 1940-1949	18.9% ***	5.6%
Built 1950-1959	15.3%	2.0%
Built 1960-1969	12.4%	-0.9%
Built 1970-1974	10.5% *	-2.8%
Built 1980-1984	5.4% ***	-7.9%
Built 1985-1989	4.0% ***	-9.3%

Built 1990-1994	6.5% ***	-6.8%
Built 1995-1999	4.5% ***	-8.8%
Built 2000-2004	7.6% ***	-5.7%
Built 2005-2009	5.5% ***	-7.7%
Built 2010-2013	9.7%	-3.5%
Zero bedrooms	36.6% ***	23.3%
One bedroom	20.7% ***	7.5%
Three bedrooms	9.2% ***	-4.1%
Four bedrooms	7.4% ***	-5.9%
Five + bedrooms	11.9%	-1.4%
In identified SMSA	6.3% ***	-6.9%

* Significant at 0.05 level

** Significant at 0.01 level

***Significant at <0.0001

Given the consistent significance of the coefficients, we focus on the obvious patterns in the calculated probabilities. Compared to units in the South, units in the Northeast and West are less likely to be affordable but units in the Midwest are more likely. Units in suburbs and the urban parts of nonmetropolitan areas are less likely to be affordable at least half the time than are units in central cities; units in large metropolitan areas are less likely to be affordable at least half the time. Compared to single family detached structures, units in all other structure types are more likely to be affordable at least half the time. Older units are more likely to be affordable at least half the time than newer units; the probabilities decline almost monotonically with age of structure. Compared to two-bedroom units, smaller units are more likely to be affordable at least half the time, while larger units are less likely.

6. Conditions associated with an always rental unit being affordable at least half the time

We used logit analysis to learn whether unit characteristics are associated with a unit that is always rental being an affordable rental at least half of its time in the housing stock. This analysis focuses on the difference between categories 7 and 8 in Table 4-7. The “always rental” category excludes many units that are grouped into other categories: the always affordable units, the units that were always rental and always affordable except for 1 survey, the always moderate or high rent units, rental units that filter down monotonically to affordable, affordable units that gentrify monotonically, and affordable units that became permanent losses.

We studied 3,961 units, all of which were always rental, 1,225 of which were affordable at least half the time and 2,736 of which were affordable less than half the time.

The variables and the base case were the same as those in the permanent loss regression, except we omitted the assisted variable because none of the units by definition were assisted. Again, we reported the weighted results using the adjusted weights.

The logit analysis was highly significant with a likelihood ratio < 0.0001 , but less than half of the variables are statistically significant. The base probability was 48.6 percent but the intercept, on which the base case probability is based, was not statistically significant.

Once again it is important to remember what the base case is in respect to the universe being studied. It is an unassisted, always rental two-bedroom single family detached unit built between 1975-1979 in a central city of an unidentified metropolitan area in the South. An always rental two-bedroom single family detached structure is unusual.

Table 4A-6 shows how changing the base case affects the probability of being affordable at least half the time.

Table 4A-6: Probability of being affordable at least half the time, if always rental but not always affordable⁵³

Category – change in base case	Probability of being affordable at least half the time	Change over base case
Northeast	30.1% ***	-18.5%
Midwest	58.2% **	9.6%
West	34.1% ***	-14.4%
Urban suburb	43.1% **	-5.5%
Rural suburb	43.9%	-4.7%
Urban non-metro	49.2%	0.7%
Rural non-metro	50.2%	1.6%
Mobile home	87.0% **	38.4%
Single-family attached	43.3%	-5.3%
2-4 unit structure	56.3%	7.7%
Structure with 5-9 units	49.8% *	1.2%
Structure with 10-19 units	48.7%	0.1%
Structure with 20-49 units	49.4%	0.8%
Structure with 50+ units	45.0%	-3.5%
Built before 1920	59.1% **	10.5%
Built 1920-1929	57.3%	8.8%
Built 1930-1939	56.1%	7.5%

⁵³The SAS© logit program tests whether the coefficients from the log likelihood calculations are statistically different from zero. In this Table, we translated those coefficients into probability estimates and then subtracted the probability of the intercept (base case). In the Table, we report the results of the statistical test of the coefficients. These are not tests of either the probability calculations or of the differences in probabilities.

Built 1940-1949	59.3% **	10.8%
Built 1950-1959	51.2%	2.7%
Built 1960-1969	50.2%	1.6%
Built 1970-1974	48.0%	-0.6%
Built 1980-1984	31.4% ***	-17.2%
Built 1985-1989	28.6% ***	-20.0%
Built 1990-1994	21.0% ***	-27.6%
Built 1995-1999	23.3% ***	-25.3%
Built 2000-2004	17.9% ***	-30.7%
Built 2005-2009	8.6% ***	-40.0%
Built 2010-2013	0.0%	-48.6%
Zero bedrooms	53.8%	5.2%
One bedroom	52.6% *	4.0%
Three bedrooms	51.5%	2.9%
Four bedrooms	51.9%	3.3%
Five + bedrooms	54.0%	5.5%
In identified SMSA	32.8% ***	-15.7%

* Significant at 0.05 level

** Significant at 0.01 level

***Significant at <0.0001

Compared to the South, always rental units in the Northeast and the West are less likely to be affordable at least half the time while units in the Midwest are more likely to. Units in the urban part of suburbs and in large metropolitan areas are less likely to be affordable at least half the time. New units, those built between 1980 and 2009 are also less likely while there is some indication that older units are more likely. Mobile homes and units in 2-4 unit structures are also more likely.

7. Looking Across All Six Regressions

Table 4A-7 combines the probability (proportion for the unit-year logit) from all six regressions to see if any patterns are evident.

First, we examine the probabilities calculated from the year-built variable. Other things being equal:

- Older units serve as affordable rental a higher proportion of their time in the sample.
- If they were affordable rentals in 1985, they are more likely to have become permanent losses by 2013.
- If sometime during the period they were part of the owner stock, they are more likely to have been part of the rental stock in at least one survey as well.

Table 4A-7: Combined logit estimates⁵⁴

Category – change in base case	Proportion of Years Affordable	Probability of permanent loss	Probability of 1985 moderate or high being affordable in 2013	Probability of “owner” unit being rental at least once	Probability of “owner” unit, rental at least once, being rental half the time	Probability of always rental being always affordable at least half the time
Base case (intercept)	12.4%***	12.7%***	23.9%***	67.0%***	13.3%***	48.6%
Northeast	7.5%***	5.6%***	18.2%***	47.1%***	6.7%***	30.1%***
Midwest	14.7%***	7.5%***	37.0%***	50.6%***	17.6%***	58.2%**
West	9.9%***	6.8%***	17.3%***	69.9%***	8.0%***	34.1%***
Urban suburb	9.5%***	11.5%	21.2%**	60.9%***	9.3%***	43.1%**
Rural suburb	8.9%***	17.5%**	12.6%***	57.8%***	11.2%*	43.9%
Urban non-metro	9.1%***	14.0%	20.2%	67.6%	7.9%***	49.2%
Rural non-metro	9.1%***	15.8%*	14.0%**	62.9%***	12.2%	50.2%
Mobile home	17.4%***	65.8%***	17.1%	83.2%***	29.8%***	87.0%**
Single-family attached	24.6%***	19.2%**	27.0%	82.7%***	25.9%***	43.3%
2-4 unit structure	41.3%***	14.1%	46.5%***	95.5%***	41.4%***	56.3%
Structure with 5-9 units	42.7%***	13.7%	44.9%***	94.9%***	41.9%***	49.8%*
Structure with 10-19 units	40.1%***	12.6%	44.1%***	95.7%***	36.7%***	48.7%
Structure with 20-49 units	36.7%***	10.0%	45.2%***	93.9%***	29.3%***	49.4%
Structure with 50+ units	26.6%***	8.7%*	32.4%**	93.8%***	19.9%**	45.0%
Built before 1920	18.1%***	39.1%***	19.4%*	80.7%***	21.4%***	59.1%**
Built 1920-1929	18.8%***	36.2%***	20.0%	79.8%***	21.0%***	57.3%

⁵⁴ The SAS© logit program tests whether the coefficients from the log likelihood calculations are statistically different from zero. In this Table, we translated those coefficients into probability estimates and then subtracted the probability of the intercept (base case). In the Table we report the results of the statistical test of the coefficients. These are not tests of either the probability calculations or of the differences in probabilities.

Built 1930-1939	19.2%***	40.1%***	19.0%*	80.2%***	21.7%***	56.1%
Built 1940-1949	17.3%***	38.2%***	20.6%	76.1%***	18.9%***	59.3%**
Built 1950-1959	14.0%***	34.2%***	24.3%	69.7%**	15.3%	51.2%
Built 1960-1969	13.2%***	21.0%***	23.2%	66.4%	12.4%	50.2%
Built 1970-1974	11.6%***	16.0%	23.2%	64.6%*	10.5%*	48.0%
Built 1980-1984	7.4%***	6.8%**	20.5%	65.0%	5.4%***	31.4%***
Built 1985-1989	6.3%***	6.9%	19.3%	58.7%***	4.0%***	28.6%***
Built 1990-1994	6.6%***	2.8%	17.1%	49.8%***	6.5%***	21.0%***
Built 1995-1999	6.2%***	1.2%**	13.0%	43.1%***	4.5%***	23.3%***
Built 2000-2004	7.4%***	1.6%**	17.5%	42.2%***	7.6%***	17.9%***
Built 2005-2009	6.9%***	4.5%	0.0%	37.4%***	5.5%***	8.6%***
Built 2010-2013	6.2%***	NA	0.0%	5.9%***	9.7%	0.0%
Zero bedrooms	13.3%***	29.3%***	17.0%**	94.3%**	36.6%***	53.8%
One bedroom	14.4%***	15.6%**	23.6%	83.4%***	20.7%***	52.6%*
Three bedrooms	8.1%***	13.0%	16.2%***	51.5%***	9.2%***	51.5%
Four bedrooms	5.6%***	16.6%*	14.4%**	40.9%***	7.4%***	51.9%
Five + bedrooms	6.1%***	16.4%	16.1%	37.9%***	11.9%	54.0%
In identified SMSA	8.0%***	15.3%**	17.4%***	65.7%	6.3***	32.8%***
Assisted	NA	7.5%***	NA	NA	NA	NA

* Significant at 0.05 level

** Significant at 0.01 level

***Significant at <0.0001

- If sometime during the period they were part of the owner stock and sometime part of the rental stock, they are more likely to have been affordable rental units at least half of their time in the stock.

Age of structure appeared to have little effect on long-term filtering or on the likelihood that always rental units will be affordable at least half the time. Structure type matters in different ways:

- On average, units in small multiunit structures spend substantially higher proportions of their unit-years as affordable units.
- Long-term filtration is much more likely among units in small multiunit structures.
- Units in multiunit structures that have a condo history are much more likely to be rental at some point than attached or detached single-family units and, if ever rental, or more likely to be affordable at least half time.

Unit size also matters:

- Small units (efficiencies and one-bedroom units) spend on average a slightly higher proportion of their time in the sample as affordable rentals.
- Small affordable units are much more likely to become permanent losses.
- Small units, if ever owner, are more likely to be rental at some point and, if rental, more likely to be rental at least half the time.

Finally, historically location has been important.

- Regionally
 - Units in the South and Midwest spend on average a higher proportion of their years in the sample as affordable rentals.
 - Affordable units in the South are more likely to become permanent losses.
 - Filtration is much more likely for units in the Midwest.
 - Units in the South and the West, if ever owner, are more likely to be rental at some point.
 - Owner units in the South and the Midwest, if ever rental, are more likely to be rental at least time.
- Metropolitan/nonmetropolitan status
 - Units in central cities spend on average a higher proportion of their years in the sample as affordable rentals.
 - Affordable units in central cities and urban suburbs are more likely to become permanent losses.
 - Moderate and high rent units in central cities and urban suburbs are more likely to filter down to affordable in the long-term.
 - Central city units, if ever owned, are more likely to be rental at least once.
 - Owner central city units, if ever rental, are more likely to be rental at least half time.

- Independent of the other locational effects, units in larger metropolitan areas:
 - Spend on average a lower proportion of their time as affordable rentals.
 - If affordable, are more likely to become permanent losses.
 - Are less likely to filter in the long term from moderate or high to affordable rentals.
 - If both owner and rental at some points in their history, are less likely to be affordable rentals for half the time.

We only examined assistance with respect to affordable rentals becoming permanent losses; they were much less likely to be lost from the housing stock.

8. Looking Towards the Future

Looking across the six regression in the preceding section, we observed how certain unit characteristics affect how units act in the housing market. We know that the structure of the housing stock changed from 1985 to 2013. The question is whether coupling past experience with our knowledge of how the housing stock has changed provides any insight into the future of affordable rental housing.

Table 4A-8 compares the 1985 and 2013 unassisted housing stock on the six characteristics used in the previous regressions. We eliminate assisted units in compiling these statistics.

Table 4A-8. Characteristics of Unassisted Units, 1985 and 2013

	1985	2013	Percentage point difference
Northeast	20.4%	18.0%	-2.4%
Midwest	24.5%	22.5%	-2.0%
South	35.5%	38.0%	2.6%
West	19.7%	21.5%	1.8%
Central city	31.4%	28.0%	-3.4%
Urban suburb	32.1%	33.6%	1.5%
Rural suburb	11.8%	14.0%	2.3%
Urban non-metro	8.6%	7.7%	-0.9%
Rural non-metro	16.1%	16.6%	0.5%
Mobile home	7.6%	6.7%	-0.9%
Single Family detached	63.3%	64.6%	1.3%
Single-family attached	4.8%	5.7%	0.9%
2-4 unit structure	9.4%	7.6%	-1.8%
Structure with 5-9 units	4.7%	4.6%	-0.2%
Structure with 10-19 units	4.0%	4.3%	0.4%
Structure with 20-49 units	3.2%	3.3%	0.1%

Structure with 50+ units	3.0%	3.3%	0.3%
Built before 1920	10.6%	6.7%	-4.0%
Built 1920-1929	6.2%	4.0%	-2.2%
Built 1930-1939	6.9%	4.3%	-2.6%
Built 1940-1949	9.1%	5.9%	-3.2%
Built 1950-1959	14.7%	10.1%	-4.6%
Built 1960-1969	16.4%	11.3%	-5.1%
Built 1970-1974	11.7%	7.9%	-3.8%
Built 1975-1979	13.8%	10.1%	-3.7%
Built 1980-1984	7.3%	5.6%	-1.7%
Built 1985-1989	1.7%	6.8%	5.1%
Built 1990-1994	0.3%	5.5%	5.1%
Built 1995-1999	0.7%	6.9%	6.2%
Built 2000-2004	0.4%	7.0%	6.6%
Built 2005-2009	0.2%	6.2%	6.0%
Built 2010-2013	0.0%	1.7%	1.6%
Zero bedrooms	1.5%	0.9%	-0.6%
One bedroom	12.0%	10.0%	-2.1%
Two bedrooms	31.3%	26.6%	-4.7%
Three bedrooms	40.7%	43.2%	2.4%
Four bedrooms	12.0%	15.8%	3.8%
Five + bedrooms	2.5%	3.6%	1.1%
In identified SMSA	48.9%	42.5%	-6.4%
In unidentified SMSA or non-metro	51.2%	57.6%	6.4%

We observed that regional location affected affordability. Units in the South and Midwest were more likely to be affordable rentals. In 2013, both the share of the housing stock in the South and West increased while share in the Northeast and Midwest declined. Overall the regional shift appears to favor affordability as the combined share of the South and Midwest increased very slightly, from 59.9 percent to 60.5 percent.

Units in central cities are more likely to be affordable. Over the period the central city share dropped from 31.4 percent to 28.0 percent. We also observed that the units in larger metropolitan areas – proxied by whether these areas are identified in the AHS -- are less likely to be affordable. The share in the identified metropolitan areas decreased substantially, from 48.9 percent to 42.5 percent. Taken together the locational shifts appear to favor affordable rental housing.

Shifts in the age distribution of the housing stock also appear to favor affordability. In 1985, 75.7 percent of the housing stock was 10 years old or older; in 2013, between 85 and 92 percent of the housing stock is 10 years old or older.⁵⁵

The 2013 housing stock has a smaller share of units in multifamily structures, structures containing 2 or more units, -- 23.1 percent, down from 24.3 percent -- ; and a smaller share in small multifamily structures, those with 2 to 19 units -- 16.5 percent, down from 18.1 percent. These shifts are unfavorable to affordability.

Perhaps the change most unfavorable to affordable rental housing is the decline in the share of small units (two bedrooms or fewer), 37.5 percent in 2013, down from 44.8 percent in 1985.

The evolution of the stock appears to favor affordable rental housing in locational shifts and in the relative age of the housing stock, but appears to run counter to affordable housing in the decrease in the multifamily share and in the share of small units, measured by number of bedrooms.

The regression in Table 4A-1 estimates the proportion of time a unit will spend as an affordable rental. We applied the fitted equation to every unassisted unit in the 1985 stock, summed the proportions, and then divided by the unassisted stock. The derived proportion was 12.5 percent. When we did the same for the 2013 unassisted stock, the derived proportion was 10.1 percent.

Based on the experience of the 1985 to 2013 period, the regression indicates that a smaller proportion of the housing stock will be affordable rental housing in the future. We are reluctant to attach too much importance to this finding because the affordable share has been so consistent over the past 28 years. As economists, we recognize that markets adjust to changing circumstances to produce what consumers demand. However, as housing economists, we recognize that residential markets adjust slowly. At the very least these results indicate that preservation efforts should focus on the units most likely to provide affordable housing and that are declining as a share of the housing stock: specifically, smaller units in small multifamily structures.

⁵⁵ If one takes the 10-year boundary as 2000, then 85 percent were built prior to 2000; if one takes 2005 as the boundary, then 92 percent were built prior to 2005. If we had chosen 15, or 25, or 35 years old as the boundary, the 2013 stock would still have a larger share of older units.

Chapter 5. Alternative Definitions of “Affordable”

The previous chapters have discussed affordable rental housing entirely in terms of a specific affordability criterion: a housing unit is affordable if it is within reach of households at half the local median income, spending no more than 30 percent of their income on housing. This is the concept of “very low income” as defined and used in many housing programs. There are other criteria, used for other housing programs or for analytical purposes. This chapter adopts two alternative criteria to measure affordability:

- (1) 60 percent of the local median, which is the standard for LIHTC units; as noted in the Introduction, the LIHTC has been the largest source of additional new assisted housing during 1985-2005;
- (2) 80 percent of the local median, which is the official definition of “low income,” and has been the more common criterion for housing programs in the past. It is also used to encompass “workforce” housing as well as affordable rental housing for a broader picture of lower-income households and their housing.⁵⁶

As we change the criterion for “affordable,” we concomitantly change the criteria for “moderate” and “high-rent.” We continue to preserve three affordability levels for each analysis:

Table 5-1. Affordability Criteria

	Very low income	LIHTC	Low income
Affordable	<50% AMI	<60% AMI	<80% AMI
Moderate	50%-80%	60%-100%	80%-120%
High-rent	>80%	>100%	>120%

These different sets of criteria result in different shares of the rental housing stock being classified as “affordable,” or as higher rent. Table 5-2 reports the affordable rental share of the total housing stock and the rental housing stock for each criterion, in both 1985 and 2005.

⁵⁶ U.S. Department of Housing and Urban Development, *Trends in Worst Case Needs for Housing, 1978-1999* (Washington, DC: December 2003, p. 10.

Table 5-2. The Affordable Rental Housing Stock under Alternative Criteria

Table 5-2. The Affordable Rental Housing Stock under Alternative Criteria: 1985-2013, 1985-2005, & 2005-2013						
1985 vs. 2013 (units in millions)	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=1.2; ACLB=0.8	
	1985	2013	1985	2013	1985	2013
Housing stock	100.9	132.8	100.9	132.8	100.9	132.8
Rental stock	34.5	43.3	34.5	43.3	34.5	43.3
Affordable rentals	15.0	19.7	20.0	26.8	28.3	36.1
Percent of total stock	14.8%	14.8%	19.8%	20.2%	28.1%	27.2%
Percent of rental stock	43.5%	45.5%	57.9%	61.8%	82.3%	83.3%
1985 vs. 2005 (units in millions)	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=1.2; ACLB=0.8	
	1985	2005	1985	2005	1985	2005
Housing stock	100.9	126.8	100.9	126.8	100.9	126.8
Rental stock	34.5	38.0	34.5	38.0	34.5	38.0
Affordable rentals	15.0	18.5	20.0	25.0	28.3	32.7
Percent of total stock	14.8%	14.6%	19.8%	19.7%	28.1%	25.8%
Percent of rental stock	43.5%	48.6%	57.9%	65.6%	82.3%	85.8%
2005 vs. 2013 (units in millions)	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=1.2; ACLB=0.8	
	2005	2013	2005	2013	2005	2013
Housing stock	126.8	132.8	126.8	132.8	126.8	132.8
Rental stock	38.0	43.3	38.0	43.3	38.0	43.3
Affordable rentals	18.5	19.7	25.0	26.8	32.7	36.1
Percent of total stock	14.6%	14.8%	19.7%	20.2%	25.8%	27.2%
Percent of rental stock	48.6%	45.5%	65.6%	61.8%	85.8%	83.3%

As Table 5-2 shows, there were small changes in the affordable rental share of the total housing stock between 1985 and 2013 for the 60 percent and 80 percent affordable criteria: an increase for the 60 percent criterion, a decrease for 80 percent. For the 1985-2005 period, all three criteria produce a decline in the affordable rental share: insignificant decreases for the 50 and 60 percent criteria, a larger and significant decrease for the 80 percent criterion. For the 2005-2013 period, all three show an increase in the affordable rental share of the housing stock: again, an insignificant change for the 50 percent and 60 percent criteria, a significant change for 80 percent.

The 80 percent criterion classifies as “affordable” all the units classified as either “affordable” or “moderate” by the 50 percent criterion, so it is clear that the decline occurred in units classified as “moderate” by the 50 percent criterion.

For all three criteria, the affordable share of the rental housing stock increased significantly. As discussed in Chapter 3, the rental housing stock declined as a share of the inventory between 1985 and 2005, from 34.1 percent to 30.0 percent; it then increased to 33.6 percent by 2013.. The total rental stock increased by 3.5 million units from 1985 to 2005, then by a further and larger increase to 43.3 million units by 2013 – a total of 7.8 million units. Over the full 28-year period, the affordable rental stock increased by 4.7 million units using the 50 percent criterion, by 6.8 million under the 60 percent criterion, and by 7.8 million under the 80 percent criterion. These increases in the affordable rental stock account for most or all of the increase in the rental housing stock: 60 percent, 87, and 100 percent, respectively. Over the first 20 years, affordable rental housing accounted for 100 percent of the increase in the rental stock using the 50 percent criterion, and by more than 100 percent using the other two. Over the last eight years, affordable rental units constituted a much smaller share of the increase: 22 percent, 34 percent, and 64 percent. The declines in moderate and high-rent housing from 1985 to 2005 may be attributable to the long decline in rental housing construction after the tax reform of 1986, and/or the homeownership boom that started in 1994 and ended in 2005, as discussed in Chapter 3.

Table 5-3 parallels Tables 3-7 and 3-11, tracking the changes in the affordable rental stock between 1985 and 2005 for the three affordability criteria and repeating the data for the 50 percent criterion from the earlier tables, for convenience. The choice of criterion clearly affects the pattern of changes, in several ways.

First, the higher the criterion, the greater the number of new additions to the affordable rental stock, which is to be expected; but also, the higher the criterion, the more new additions exceed removals and the more important are net additions to the housing stock as a source of affordable rental housing, neither of which is necessarily to be expected. Net additions constitute 13 percent of the increase for the 50 percent criterion, 25 percent for the 60 percent criterion, and well over half for the 80 percent criterion.

[illegible]

Net increase	4.7	6.8	7.7	3.5	5.0	4.3	1.2	1.8	3.4
Net additions	6.0%	20.7%	47.8%	9.2%	21.4%	60.6%	-30.0%	-16.3%	5.3%
Net filtering and gentrification	61.1%	47.6%	17.3%	78.2%	64.8%	33.4%	45.6%	21.8%	2.5%
Net tenure shift	34.5%	32.8%	35.8%	15.4%	16.4%	9.7%	90.4%	98.9%	92.6%
Net temporary loss	-1.6%	-1.1%	-0.9%	-2.9%	-2.6%	-3.7%	-6.0%	-4.4%	-0.4%

New additions are 6.3 million for the 60 percent criterion and 4.3 million for the 50 percent criterion; the difference of two million units is essentially the same as the two million Low Income Housing Tax Credit units that were placed in service between 1987 and 2013, and that qualified for the tax credit.⁵⁷ The AHS does not identify tax credit units, however, and therefore we cannot say with any certainty how many LIHTC units may have accounted for a share of the difference in affordable rental housing between the two criteria. (It could be argued that the two million number for new additions affordable to households with incomes between 50 percent and 60 percent of median is reasonably consistent with the 3.2 million new additions affordable to households with incomes between 60 percent and 80 percent of median; few of those 3.2 million are likely to be tax credit units. At the same time, it is worth mentioning that in our first report, we calculated that there were 1.458 million units that were affordable under the 60 percent criterion in 2005, quite close to the 1.575 million LIHTC units placed in services between 1987 and 2005. For both periods, there is a remarkable coincidence between the LIHTC units and the higher number of affordable units in the stock.)

Filtering and gentrification are much less important by the 80 percent criterion than by either of the other two criteria. Between 1985 and 2013, 2.5 million units filtered under the 80 percent criterion – about half as many as under either of the lower criteria. In addition, 400,000 to 500,000 fewer units gentrified under the 80 percent criterion. The net contribution to the increase in affordable units between 1985 and 2013 is less than half as large for the 80 percent criterion – 1.3 million compared to 2.9 or 3.2 million. This is understandable simply because the higher the criterion, the fewer units there are that *can* filter, and the less likely are low-rent units to gentrify – they must meet a higher standard to do so. Interestingly, however, the number that filter is larger by the 60 percent criterion than the 50 percent criterion. Some 300,000 more units filter, while only 100,000 fewer units gentrify. As a matter of arithmetic, more units filter down to the range of 50 to 60 percent – they are affordable to households with incomes between 50 and 60 percent of median – then filter down from the 50 to 60 percent range to below 50 percent.⁵⁸ This does not appear to reflect the LIHTC, and there is no intuitive explanation; it would require further, possibly extensive research into the characteristics of the affected units. As a share of the net increase in affordable units, filtering and gentrification are less important as the affordability criterion rises.

The other sources of change are less important. Tenure shifts account for about 34 percent of the increase by the 50 percent criterion; 32 percent by the 60 percent criterion; and 36 percent by the 80 percent criterion. Temporary losses had the same small net change under all three criteria.

⁵⁷ This figure for qualifying LIHTC units is calculated from Abt Associates, Inc. *Development and Analysis of the National Low-Income Tax Credit Housing Database* (July 1996), Table 4-3, for projects placed in service from 1987 to 1994, and U.S. Department of Housing and Urban Development, *HUD's National Low-Income Housing Tax Credit Database: Projects Placed in Service Through 2013*. Both are available at the HUD USER website, <https://www.huduser.gov/portal/datasets/lihtc.html>. Both report the total number of tax credit units placed in service during the years covered, and the percentage of units in LIHTC projects that in fact qualify for the tax credit because they can serve households with incomes below 60 percent of local median income.

⁵⁸ There are 7.1 million more affordable rental units in 2013 when the affordability criterion is set at 60 percent rather than 50 percent of area median income. About 300,000 of these are units that filter from moderate to affordable when the criterion is 60 percent, but not when it is 50 percent.

Table 5-4 shows the forward-looking analyses for the three affordability criteria: what happened to the 1985 affordable rental stock over the next 28 years? In general, the higher the income criterion, the more of the 1985 units were affordable in 2013, and the fewer had gentrified. These statements are also true for both 1985-2005 and 2005-2013; indeed, the previous sentence is taken verbatim from our first report (except for the change in the end year). They are to be expected; as noted above, higher income criteria leave less room for units to gentrify, and more room for originally affordable units to remain affordable. The latter point is most obvious in comparing the 50 percent and 80 percent criteria: all the units that filtered, gentrified, or fluctuated between “affordable” and “moderate” under the 50 percent criterion, were affordable in both years under the 80 percent criterion. The other differences are not as important, though it is worth noting that the number and share that shifted from affordable rental to owner housing is greater for the higher criteria; there is apparently, and quite plausibly, more interest among homebuyers in better-quality rental units, and landlords of higher-rent units are perhaps more willing to sell their units.

Table 5-5 shows the corresponding backward-looking analyses: where did the 2005 affordable rental stock come from? The patterns are similar, and for the same reasons: the higher the criterion, the more units were affordable in both years and the fewer filtered (at least as a share of the 2013 affordable rental stock). Table 5-5 also reports the number of units that were always affordable, which also increases as the criterion becomes higher: 3.2 million were always affordable when the criterion is 50 percent, two and one-half times that number when the criterion is 80 percent. Further, the number of units added to the stock after 1985 that were always affordable also rises, in the same way: 800,000 added units were always affordable when the criterion is 50 percent, 3.2 million when the criterion is 80 percent. Always affordable units account for about 20 percent of the 2013 affordable inventory at the 50 percent criterion, about 22 percent of the inventory at 60 percent, and about 32 percent of the inventory at 80 percent.

Very different dynamics occur for different affordability criteria. There is much less gentrification, much less filtering, and much less fluctuation in general when the affordability criterion is set at 80 percent of area median income rather than 50 percent; the affordability data are smoother and seem to tell a simpler story.

This simpler story, however, obscures the differences in income and ability to afford housing for very low income households. There is a wide gap between affordability for households with incomes at 50 percent of median, or less, and affordability for households with incomes at 80 percent of median. In 2013, median household income in the United States was \$52,250. Half of that median was \$26,125; 80 percent of that median was \$41,800. A household with an income of \$26,125 could afford \$653 per month for rent; a household with an income of \$41,800 could afford \$1,045 per month. The difference is large. Calling these both “affordable” ignores the difficulty that a very low income household would have in paying for a \$1,045 apartment. For a family at half the median, the \$1,045 monthly rent would take 48 percent of the household’s income. Most very low income households would have to pay more than half their income for rent, and would count as households with “worst case needs” and a priority for housing assistance.

Table 5-4. Forward-Looking Analysis under Alternative Criteria: 1985-2013, 1985-2005, & 2005-2013 -- Where did the Affordable 1985 Stock Go?						
1985-2013	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=0.8; ACLB=1.2	
(counts in millions)	Number	Percent	Number	Percent	Number	Percent
Affordable in 1985	15.0	100.0%	20.0	100.0%	28.3	100.0%
Still affordable in 2013	6.2	41.7%	9.4	47.2%	15.6	55.0%
Gentrified	1.7	11.5%	1.6	8.1%	1.2	4.1%
To owner stock	1.9	12.6%	2.7	13.3%	4	14.1%
To seasonal or URE	0.8	5.3%	1	5.1%	1.3	4.7%
To temporary loss	0.3	1.8%	0.3	1.6%	0.4	1.4%
To permanent loss	4.1	27.1%	4.9	24.6%	5.8	20.6%
1985-2005	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=0.8; ACLB=1.2	
(counts in millions)	Number	Percent	Number	Percent	Number	Percent
Affordable in 1985	15.0	100.0%	20.0	100.0%	28.3	100.0%
Still affordable in 2005	7	46.8%	10.3	51.8%	16.6	58.7%
Gentrified	1.7	11.4%	1.6	8.2%	1.1	3.8%
To owner stock	2.2	14.7%	3	15.0%	4.6	16.1%
To seasonal or URE	0.8	5.0%	1	4.8%	1.2	4.4%
To temporary loss	0.4	2.5%	0.4	2.2%	0.6	2.0%
To permanent loss	2.9	19.6%	3.6	17.9%	4.2	15.0%
2005-2013	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=0.8; ACLB=1.2	
(counts in millions)	Number	Percent	Number	Percent	Number	Percent
Affordable in 2005	18.5	100.0%	25.0	100.0%	32.7	100.0%
Still affordable in 2013	11	59.4%	16.6	66.3%	24.3	74.3%
Gentrified	3.2	17.3%	2.9	11.8%	1.7	5.1%
To owner stock	1.8	10.0%	2.4	9.5%	3.1	9.4%
To seasonal or URE	1	5.6%	1.3	5.3%	1.6	5.0%
To temporary loss	0.2	1.3%	0.3	1.3%	0.4	1.1%
To permanent loss	1.2	6.4%	1.4	5.7%	1.7	5.1%

Table 5-5. Backward-Looking Analysis Under Alternative Criteria: 1985-2013, 1985-2005, & 2005-2013 Where did the 2013 Affordable Rental Stock Come From?						
1985-2013	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=0.8; ACLB=1.2	
(Counts in millions)	Number	Percent	Number	Percent	Number	Percent
Affordable in 2013	19.7	100.0%	26.8	100.0%	36.1	100.0%
Affordable in both years	6.2	31.7%	9.4	35.2%	15.6	43.2%
Filtered down	4.6	23.4%	4.9	18.2%	2.5	7.0%
From owner stock	3.8	19.5%	5.3	19.8%	7.3	20.2%
From seasonal stock	0.5	2.3%	0.6	2.3%	0.8	2.2%
Temporary loss in 1985	0.2	1.0%	0.3	0.9%	0.3	0.9%
New to stock	4.3	22.0%	6.3	23.6%	9.5	26.4%
Always affordable:						
1985-2013	3.2	16.2%	4.4	16.5%	8.4	23.2%
added after 1985	0.8	4.2%	1.5	5.5%	3.2	8.8%
Total	4.0	20.4%	5.9	22.1%	11.6	32.1%
1985-2005	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=0.8; ACLB=1.2	
(Counts in millions)	Number	Percent	Number	Percent	Number	Percent
Affordable in 2005	18.5	93.8%	25.0	93.2%	32.7	90.5%
Affordable in both years	7.0	35.6%	10.3	38.6%	16.6	46.1%
Filtered down	4.5	22.6%	4.9	18.2%	2.5	7.0%
From owner stock	3.0	15.1%	4.1	15.2%	5.4	14.8%
From seasonal stock	0.5	2.6%	0.7	2.6%	0.9	2.4%
Temporary loss in 1985	0.3	1.3%	0.3	1.2%	0.4	1.1%
New to stock	3.3	16.5%	4.6	17.4%	6.9	19.0%
Always affordable:						
1985-2005	3.2	16.2%	4.4	16.5%	8.4	23.2%
added between 1985-2005	0.5	2.5%	0.9	3.4%	2.2	6.0%
Total	3.7	18.7%	5.3	19.9%	10.5	29.2%
2005-2013	ACUB = 0.8; ACLB=0.5		ACUB=1.0; ACLU=0.6		ACUB=0.8; ACLB=1.2	
(Counts in millions)	Number	Percent	Number	Percent	Number	Percent
Affordable in 2013	19.7	100.0%	26.8	100.0%	36.1	100.0%
Affordable in both years	11.0	55.7%	16.6	61.8%	24.3	67.2%
Filtered down	3.8	19.0%	3.3	12.5%	1.8	4.9%
From owner stock	3.3	16.8%	4.6	17.1%	6.6	18.4%
From seasonal stock	0.7	3.4%	0.9	3.5%	1.2	3.5%

Temporary loss in 2005	0.2	0.9%	0.3	0.9%	0.3	1.0%
New to stock	0.8	4.2%	1.1	4.2%	1.8	5.1%
Always affordable:						
2005-2013	3.7	18.7%	5.3	19.9%	10.5	29.2%
added after 2005	0.3	1.7%	0.6	2.2%	1.0	2.9%
Total	4.0	20.4%	5.9	22.1%	11.6	32.1%

The difference in ability to pay between households with half the median income and those with 60 percent of the median is much smaller, of course, but still noticeable. The latter would be able to pay \$784 for rent. That rent is still a stretch for a very low income household; for a family with half the median income, that rent would require 36 percent of the household's monthly income.

It is worth noting, however, that the changes in the affordable rental stock over the full 28-year period are similar if the affordability criterion is set at 50 percent or 60 percent of area median income. Filtering and gentrification are much more important under both criteria than they are at the 80 percent criterion; the changes in the affordable rental stock are often similar under the two lower criteria than under the highest one.

The choice of affordability criterion depends on what question is being asked. For the purposes of analyzing the housing of very low income households, the 50 percent criterion is most relevant; it is consistent with legislated priorities for housing assistance and identifies households with important housing problems. For someone concerned with the effect of the LIHTC, however, the 60 percent criterion would probably be more useful, and might result in the same qualitative conclusions, although it would certainly be useful if a match could be achieved between the AHS sample and the LIHTC program data.

All in all, we believe that the 50 percent criterion is the most meaningful criterion for this report.⁵⁹

⁵⁹ An affordability criterion of 30 percent of area median – households with “extremely low income” – would also be useful; such households have more acute affordability problems and much more often live in housing with severe physical problems.

Chapter 6. Changes in Some Metropolitan Areas

The last three chapters have analyzed the long-run dynamics of affordable rental housing for the nation as a whole. This chapter describes the changes in each of several large Metropolitan Statistical Areas (MSAs) over the same period, following the old axiom that “all housing markets are local.” We first explain the basis for selecting the MSAs and discuss their boundaries; over the 28 years from 1985 to 2013 the boundaries of most MSAs have changed, and we need to use consistent boundaries for the entire period. After these important preliminaries, we present the data for the MSAs, on a similar basis to the national analysis. We highlight what we consider to be the most important findings, comparing the MSAs to the nation as a whole, and also comparing the MSAs to each other. We provide a set of identical tables for the MSAs, and for three MSA, for their central cities, and their suburbs.

MSA Boundaries

For our purposes, it is most useful to have consistent Metropolitan Statistical Area (MSA) boundaries. In our first report, we used the 1983 boundaries of metropolitan areas for consistency over the 22-year period from 1985 to 2005. These boundaries were established in 1983, after the 1980 Census of Population and Housing. They were certainly the most convenient boundaries for our longitudinal statistical research and analysis. Once boundaries are established, it is relatively easy to use the same boundaries going forward from year to year. If instead the current boundaries (for example, the 2013 boundaries) are projected backward, it is necessary to restate the data for earlier years, which may not be feasible, and indeed to restate the data for earlier years more than once, as boundaries continue to change.⁶⁰

This meant, however, that we had some unusual MSA boundaries. For example, “The Chicago MSA” as defined by OMB more than 30 years ago is no longer a very meaningful concept of “Chicago.” As it was defined then, the MSA as defined consisted of only three counties: Cook (including the city), DuPage, and McHenry. At present, there are 14 counties in the Chicago Consolidated Metropolitan Statistical Area (CMSA): nine in Illinois, four in Indiana, and one in Wisconsin. We have chosen a more limited area of six Illinois counties, five of which are part of the Chicago-Aurora-Joliet, IL Metropolitan Division delineated by the Census Bureau, and one (Lake County) that is part of the Lake County-Kenosha County, IL-WI Metropolitan Division. We include Cook County, four of the five Illinois counties that are contiguous to Cook County (DuPage, Lake, Kane, and McHenry Counties), and one that touches DuPage and Kane Counties (Kendall County). We omit one contiguous county (Will County), because it covers a large area that is partly suburban to Chicago, partly consists of the county seat (Joliet) and its suburban area, and is partly rural.

⁶⁰ For the same reason, price indices are nearly always Laspeyres indices, based on a set of goods and services established in a base year and obtaining new price data for those goods and services in future years, rather than Paasche indices, based on a current set of goods and services and attempting to obtain past price data for them.

These six counties contain 82.1 percent of the population of the Chicago MSA (7.870 million population out of 9.585 million estimated from the 2010 decennial Census). We do not think that the inclusion or exclusion of one or two counties affects our analysis of affordable rental housing in the Chicago area. Similar boundary issues arise for other MSAs.

The Seven Large MSAs

We have based our choice of metropolitan areas to study primarily on the sample sizes in the AHS. While we would have liked to include more metropolitan areas, including some that have experienced unusual housing conditions over the 1985-2013 period such as Las Vegas, the numbers of sample cases available for these areas were just too small to support reliable analysis (e.g., 208 cases for the Las Vegas metropolitan area). To increase sample size, in some instances we have combined metropolitan areas where the combination seemed to represent an interrelated set of housing markets.

The large metropolitan areas which we are analyzing in this chapter are: New York/Nassau-Suffolk, Greater Los Angeles, Greater Chicago, Northern New Jersey, Philadelphia, Detroit, and Greater Oakland-San Francisco. Along with Greater Chicago, we also examined a more narrowly defined Chicago metropolitan area as defined by the Census, consisting of Cook, DuPage, and McHenry Counties (#1600 in FIPS, the Federal Information Processing System). Five of these areas – but with some differences in boundaries – were also included in our first report: New York, Los Angeles, Chicago, Philadelphia, and Detroit. In that report, we also included Washington and Houston. We exclude them in this report on the basis of sample size.

The included areas are all large housing markets. In 1985, they contained almost one out of every five housing units in United States (19.5 percent), and in 2013, they included one out of every six (16.8 percent). With respect to rental housing, they contained almost one out of every four rental units (24.5 percent) in 1985, and, more than one out of every five in 2013 (21.5 percent). As a group, these seven areas grew substantially less than did the country as a whole. The U.S. overall housing stock increased by 24.0 percent between 1985 and 2013. The increases in these metropolitan areas ranged from a low of 7.2 percent for New York/Nassau-Suffolk to a high of 17.3 percent for Greater Chicago. The New York/Nassau-Suffolk area excludes New Jersey; the New Jersey markets are grouped as Northern New Jersey. Greater Chicago does not contain any of the Indiana counties that are part of the Chicago metropolitan area. The housing stock in the narrower Chicago area grew by only 18,000 units over the 28-year period.

Table 6-1 contains key information about the metropolitan areas that we examined. The numbers in parentheses next to the metropolitan areas are the AHS codes for those areas. The difference between the total sample for an area and the samples in 1985 and 2013 are those sample units that entered the stock after 1985 and left the stock before 2013 or that were temporarily out of the stock in either 1985 or 2013.

Table 6-1: Overview of the Metropolitan Areas Examined

<i>New York/Nassau-Suffolk (excludes New Jersey)</i>		
<i>AHS Metropolitan areas included:</i> New York (FIPS Code #5600), Nassau-Suffolk (5380), undisclosed locations (9992)		
<i>Counties:</i> Bronx, Kings, New York, Putnam, Queens, Richmond, Rockland, Westchester, Nassau, Suffolk		
<i>Housing stock: 1985:</i> 4,867,000	<i>2013:</i> 4,538,000	<i>Percent change:</i> 7.2%
<i>Total sample:</i> 2,512	<i>Housing stock 1985:</i> 1,953	<i>Housing stock 2013:</i> 2,256
<i>Greater Los Angeles</i>		
<i>AHS Metropolitan areas included:</i> Los Angeles-Long Beach (4480), Anaheim-Santa Ana (360), Riverside San Bernardino ((680), Oxnard-Ventura (6000)		
<i>Counties:</i> Los Angeles, Orange, Ventura, Riverside, San Bernardino		
<i>Housing Stock: 1985:</i> 4,528,000	<i>2013:</i> 5,197,000	<i>Percent Change:</i> 14.8%
<i>Total Sample:</i> 2,512	<i>Housing Stock 1985:</i> 1,942	<i>Housing stock 2013:</i> 2,345
<i>Greater Chicago (Illinois only)</i>		
<i>AHS Metropolitan areas included:</i> Chicago (1600), Lake County (3965), Aurora-Elgin (0620), undisclosed locations (9991)		
<i>Counties:</i> Cook, Kane, Du Page, Kendall, McHenry, Lake		
<i>Housing stock: 1985:</i> 2,744,000	<i>2013:</i> 3,218,000	<i>Percent change:</i> 17.3%
<i>Total sample:</i> 1,684	<i>Housing stock 1985:</i> 1,209	<i>Housing stock 2013:</i> 1,490
<i>Chicago (FIPS Code #1600)</i>		
<i>Counties:</i> Cook, DuPage, McHenry		
<i>Housing Stock: 1985:</i> 2,323,000	<i>2013:</i> 2,341,000	<i>Percent Change:</i> 0.8%
<i>Total Sample:</i> 1,227	<i>Housing Stock 1985:</i> 1,029	<i>Housing stock 2013:</i> 1,061

Northern New Jersey

AHS Metropolitan areas included: Newark (5640), Bergen-Passaic (875), Monmouth-Ocean (5190), Jersey City (3640), Middlesex-Somerset-Hunterdon (5015), Trenton (8480), undisclosed locations (9993)

Counties: Bergen, Passaic, Hudson, Hunterdon, Middlesex, Somerset, Monmouth, Ocean, Essex, Morris, Sussex, Union

Housing stock: 1985: 2,392,000 ***2013:*** 2,733,000 ***Percent change:*** 14.3%

Total sample: 1,436 ***Housing stock 1985:*** 1,046 ***Housing stock 2013:*** 1,293

Philadelphia

AHS Metropolitan areas included: Philadelphia (6160)

Counties: Bucks, Chester, Delaware, Montgomery, Philadelphia, Burlington (NJ), Camden (NJ), Gloucester (NJ)

Housing stock: 1985: 1,963,000 ***2013:*** 2,146,000 ***Percent change:*** 9.3%

Total sample: 1,114 ***Housing stock 1985:*** 856 ***Housing stock 2013:*** 1,007

Detroit

AHS Metropolitan areas included: Detroit (2160)

Counties: Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Wayne

Housing stock: 1985: 1,741,000 ***2013:*** 1,893,000 ***Percent change:*** 8.7%

Total sample: 1,014 ***Housing stock 1985:*** 761 ***Housing stock 2013:*** 889

Greater Oakland-San Francisco

AHS Metropolitan areas included: Oakland (5775), San Francisco (7360), San Jose (7400), Santa Rosa-Petaluma (7500)

Counties: Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Santa Cruz, Sonoma

Housing stock: 1985: 1,976,000 ***2013:*** 2,279,000 ***Percent change:*** 15.3%

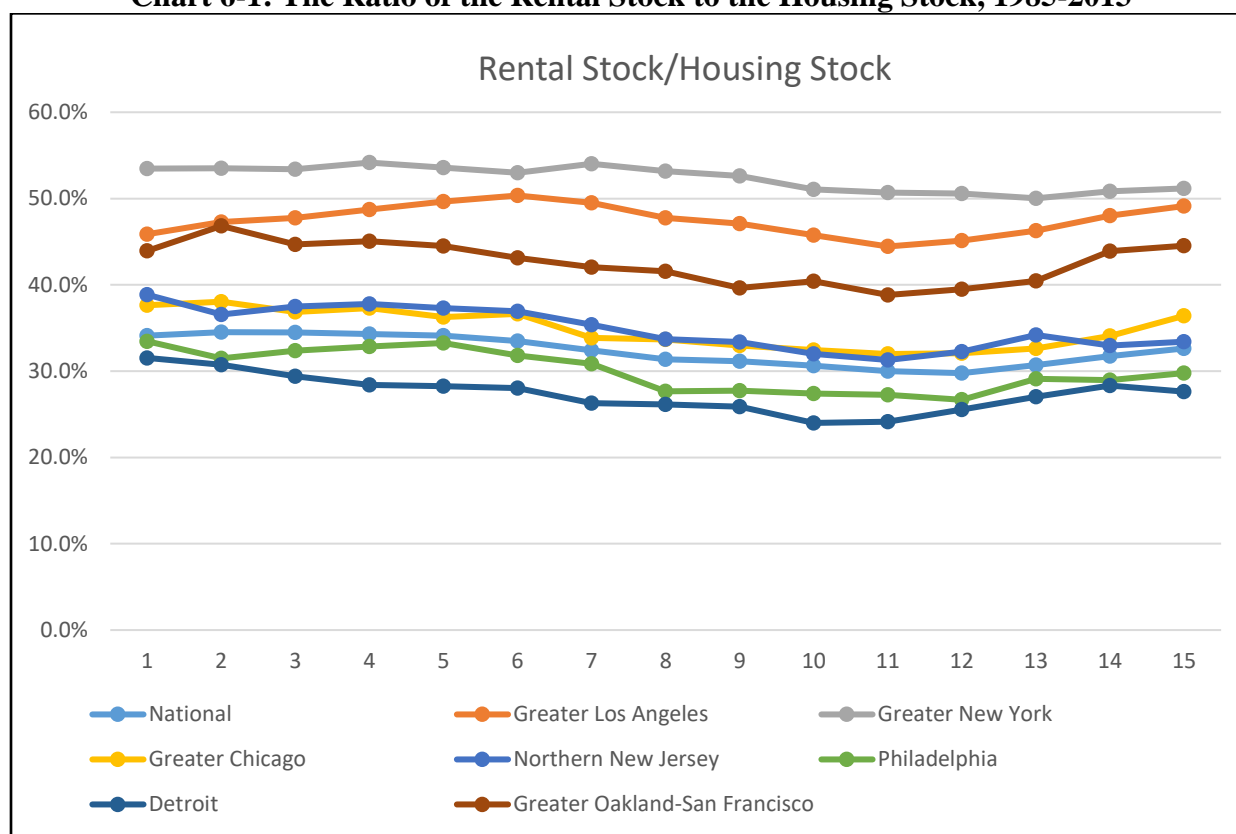
Total sample: 1,073 ***Housing stock 1985:*** 854 ***Housing stock 2013:*** 1002

Changes in Rental, Affordable, and Assisted Housing

The following charts show several ratios that we reported in Chapter 3 for the U.S. as a whole: the ratio of the rental stock to the housing stock; the ratio of the affordable rental stock to the rental stock; and the ratio of assisted rental housing to the rental stock. In these charts we report the ratios for the U.S. and for each of the seven metropolitan areas (we exclude the narrowly-defined Chicago MSA). There is quite a bit of interesting diversity among these markets.

Chart 6-1 compares the seven areas to each other and to the nation with respect to the importance of rental housing in the entire housing stock. Nationally, this ratio fluctuated in the range of 30 to 35 percent over the 1985 to 2013 period.⁶¹ Three of the metropolitan areas had much higher ratios. New York/Nassau-Suffolk fluctuated between 50 and 55 percent; greater Los Angeles between 44 and 50 percent, and greater Oakland-San Francisco between 39 and 47 percent. The rental housing share of all housing is closer to the national pattern for the remaining four metropolitan areas, with greater Chicago and Northern New Jersey having slightly higher ratios and Philadelphia and Detroit having slightly lower ones.

Chart 6-1: The Ratio of the Rental Stock to the Housing Stock, 1985-2013



⁶¹ This ratio is not the converse of the homeownership rate, which excludes vacant units and URE and seasonal units. See discussion of Table 3-3.

The homeownership boom is notable in this chart. The national ratio declined from 1985 to 2007 and then rose modestly during the Great Recession and relatively weak recovery. Over the full period from 1985 to 2013, it declined from 34.1 percent to 32.6 percent of the housing stock. Five of the seven metropolitan areas also experienced a decline between 1985 and 2013. Both California metropolitan areas saw very slight increases, less than one percentage point in each case.

Chart 6-2 examines the ratio of affordable rentals to all rentals. The national ratio fluctuated in the range of 43 to 50 percent with the low in 1985 and the high in 2003. Most MSAs were consistently below that ratio. Detroit was consistently much higher, but with a sharp drop from 2009 to 2013; in 2001 70 percent of its rental stock was affordable, by 2013 only 44 percent was. Chicago fluctuated around the national ratio, but was markedly higher between 1995 and 2001. Philadelphia was consistently slightly below the national ratio, except for 2003 and 2007. The national ratio was higher in 2013 than it had been in 1985, 45.5 percent compared to 43.5 percent. The same was true for five of the seven metropolitan areas, with smaller increases than the national average for New York and Los Angeles, and markedly larger ones for Northern New Jersey, Philadelphia, and Oakland-San Francisco. The ratio in Chicago dropped insignificantly, the ratio in Detroit very substantially, from 52.8 percent to 43.6 percent.

Chart 6-2: Ratio of the Affordable Rental Stock to the Rental Stock, 1985-2013

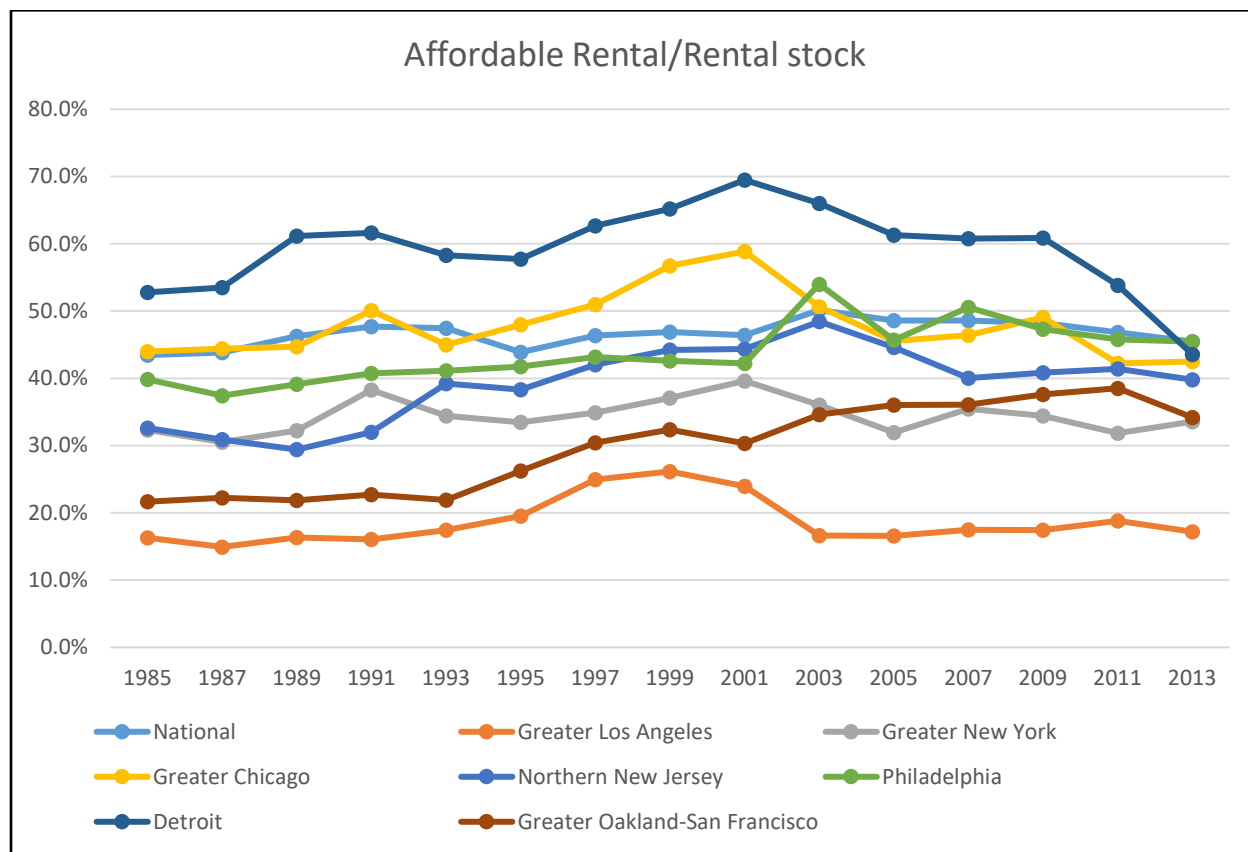
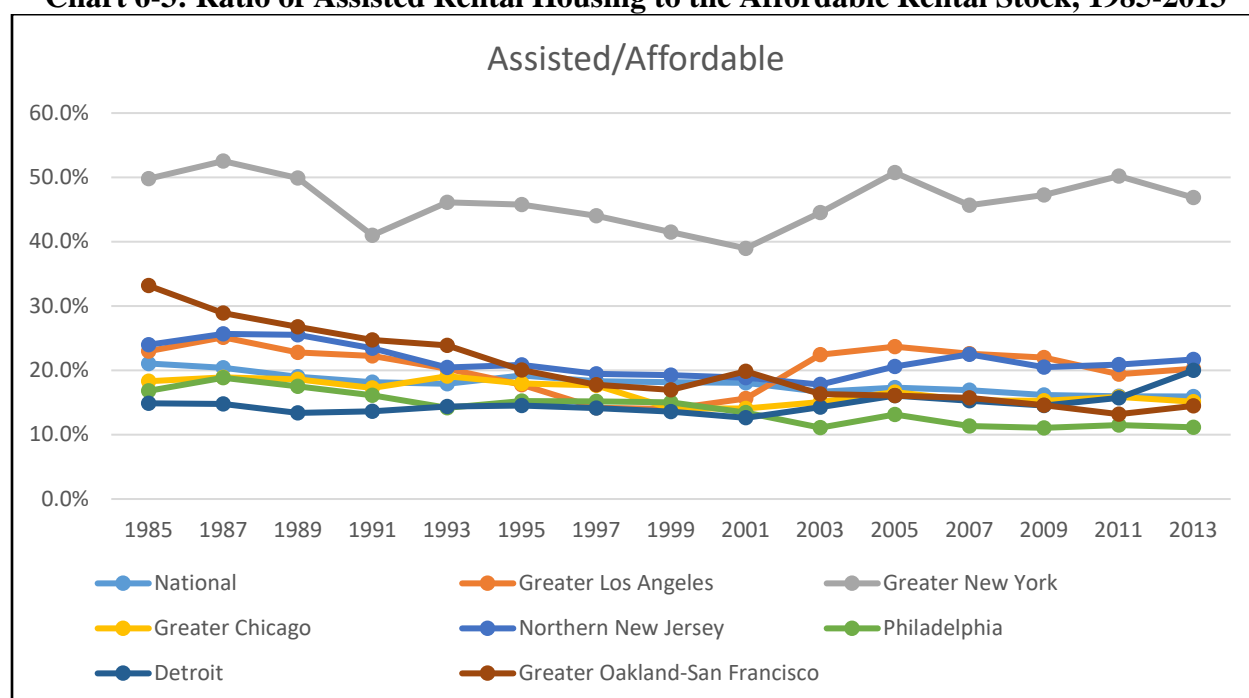


Chart 6-3 shows how assisted housing contributed to affordability in the seven areas. As shown in Table 3-10, assisted housing constituted a gradually declining share of the affordable rental

stock between 1985 and 2013 – starting at 21.1 percent in 1985 and ending at 16.7 percent in 2013. Six of the seven metropolitan areas also experienced a decline in the assisted share of their affordable rental housing, most of them of a magnitude similar to the national change, but smaller. In New York/Nassau Suffolk, Greater Los Angeles, Greater Chicago, and Northern New Jersey, the decline was about three percentage points. In Philadelphia, it was 5.7 points, modestly higher than the national decline. In all of these metropolitan areas, the affordable rental stock increased between 1985 and 2013. In Oakland-San Francisco, the decline in the assisted share was very large – from 33.2 percent in 1985 to 14.5 percent in 2013. This was the result of a 20 percent decline in the number of assisted units and a near doubling of the affordable rental stock (an 85 percent increase). In Detroit, the assisted share rose, from 14.9 percent in 1985 to 20.0 percent in 2013. The number of assisted units was essentially unchanged, but the affordable rental stock dropped by over 20 percent.

Chart 6-3: Ratio of Assisted Rental Housing to the Affordable Rental Stock, 1985-2013



As Chart 6-3 shows, the assisted share of affordable rental housing was consistently greater than the national average in New York/Nassau-Suffolk, Northern New Jersey, and Greater Los Angeles; in Chicago and Philadelphia it was consistently smaller. New York/Nassau-Suffolk stands out with assisted units contributing between 39 and 53 percent of affordable rental housing. New York City has by far the largest public housing program in the country. The rest of the areas have ratios that are similar to the national ratio, although Philadelphia and Detroit are consistently below the national average.

Affordable Housing in the Largest MSAs, 1985-2013

In the remainder of this chapter, we report detailed tabulations for these seven metropolitan areas. We also report the tabulations for the central city in each metropolitan area,

and the suburban counties, in parallel sets of tables for the three largest areas for which the sample sizes are adequate for the analysis. The analysis covers the same ground as the national analysis in Chapter 3, by and large. We generally do not report changes by decade, and we report less detail on the characteristics of affordable rental housing. We have not conducted a unit-years analysis to compare with Chapter 4, or an analysis of alternative affordability criteria as in Chapter 5.

We report four tables for each geographic category. They correspond to some of the tables in Chapter 3. For the MSA, Table 6-2 reports the composition of the housing stock by status in 1985 and 2013, and the changes during the period, similarly to Table 3-2. Table 6-3 contains the forward-looking and backward-looking analyses, closely matching Tables 3-5 and 3-6. Table 6-4 reports data on always affordable units, assisted units, and additions and removals during the period. Table 6-5 reports structure type for the affordable housing stock, one of the characteristics covered in Table 3-13. We have not tried to cover all the topics in the national analysis. Instead, we describe some of the most important characteristics and other noteworthy findings, comparing the MSAs to the nation and to each other. Each table appears on two pages, and for convenience is divided into an “a” and “b” page. The former reports the data for New York, Los Angeles and Chicago, and also for the more narrowly defined Chicago metropolitan areas; the latter for Northern New Jersey, Philadelphia, Detroit, and Oakland-San Francisco. The MSAs are arranged by sample size, in descending order.

The remaining tables look more closely at the three largest metropolitan areas. The same information is provided, in the same order, in Tables 6-6 to 6-9 for central cities, and Tables 6-10 to 6-13 for the suburbs. In addition, we report the changes in composition for 1985-2005 and 2005-2013, in Tables 6-6 and 6-10.

Metropolitan Statistical Areas

As we reported in Chapter 3, the affordable rental share of the housing stock did not change between 1985 and 2013 – or, for that matter, between 1985 and 2005 and between 2005 and 2013. Only two of these seven large metropolitan areas can be said to have had that experience. In New York/Nassau-Suffolk, the affordable rental share of the stock was 17.2 percent in 1985 and 17.3 percent in 2013. Between 1985 and 2005, however, the affordable share dropped to 16.2 percent. Philadelphia’s experience was much the same. The affordable rental share was 13.3 percent in 1985 and 13.5 percent in 2013; but in 2005 it was 12.5 percent. The narrowly defined Chicago MSA also fits this pattern: 17.8 percent affordable in both 1985 and 2013, but 16.9 percent in 2005.

The other five metropolitan areas had diverse experiences. Greater Chicago had a modest decline between 1985 and 2013, with a larger decline between 1985 and 2005 and a partial recovery between 2005 and 2013. Detroit saw a much larger decline throughout the period. Northern New Jersey was the opposite of Chicago, with a moderate increase in its affordable rental share over the whole period, an increase from 1985 to 2005 and a decline between 2005 and 2013. Los Angeles also had a moderate increase over the whole period, but the affordable

rental share was the same in 2005 as in 1985. Oakland-San Francisco had a large increase over the period, consisting of increases in each subperiod.

The homeownership boom made itself felt in every MSA, to a lesser or greater extent – New York and Los Angeles being in the former category and the other five metropolitan areas in the latter. In all seven, there was an increase in the number of owned units, ranging from 60,000 in Detroit to almost 300,000 in Northern New Jersey.

Nationally, 41.7 percent of the 1985 affordable rental stock was still affordable in 2013 (Table 3-4). Among these metropolitan areas, the proportion ranged from 58.6 percent in New York to 26.1 percent in Detroit (Table 6-3). New York's large public housing program undoubtedly contributed to its total; Detroit lost over a quarter of its 1985 affordable rental stock (more than half of the loss occurred after 2005). Conversely, almost 40 percent of Detroit's 1985 affordable rental stock was permanently lost from the housing inventory by 2013, while New York, Northern New Jersey, and Los Angeles, incurred losses of less than 20 percent. Los Angeles saw by far the most gentrification, as 39.8 percent of its 1985 affordable rental stock moved into the higher rent categories. New York was second at 21.7 percent; the other five all had between 10 and 20 percent, with Philadelphia and Detroit having the least, at 10.6 percent and 11.4 percent, retrospectively.

Looking backward, additions to the affordable rental stock were generally less important in these MSAs than nationally (Table 6.4). Los Angeles, at 17.5 percent, was the highest, not significantly less than the national figure of 17.9 percent. Chicago, at 12 percent, was second highest; Detroit, at 10 percent was third.

Filtering was much more important in each MSA, and higher than the national rate of 23.4 percent in all but New York (23.0 percent) and Detroit (22.1 percent). Filtering was especially important in Northern New Jersey, accounting for 43.1 percent of the 2013 affordable rental stock, and in Oakland-San Francisco, where it accounted for 40.4 percent. About 40 percent of the 2005 affordable rental stock in Washington had filtered down from higher rent categories. In every MSA, filtering added far more units to the affordable rental stock than did new construction and other additions – at least twice as many units in all but New York (85 percent more) and Los Angeles (57 percent). Also, substantially more affordable rental units were added by filtering than were lost through gentrification. In New York and Los Angeles, the difference was about 10 to 15 percent; in the other metropolitan areas, it ranged from 50 percent more (Detroit) to four times as many (Oakland-San Francisco). Nationally, the ratio was almost three to one (Tables 3-5 and 3-6).

More units switched from owned or seasonal to affordable rental than the reverse, in every metropolitan area except Northern New Jersey, mostly by a ratio of two to one or more. This is consistent with the national experience; nationally, the ratio was about 1.7 to one (Table 3-6).

Assisted housing units constitute between 15 and 50 percent of the affordable rental stock in 1985, between 11 and 47 percent in 2013 (Table 6-4). Omitting New York, the highest share is 33 percent in Oakland-San Francisco in 1985 and just over 20 percent in Northern New Jersey and Los Angeles.

Nationally, of the units that were affordable in both 1985 and 2013, half were affordable in every survey in between (Tables 3-6 and 3-8a). Among these metropolitan areas, the share ranged from one-third in Chicago and Philadelphia to two-thirds in Los Angeles and 80 percent in New York. In the other metropolitan areas, the share was just above the national share (Table 6-4). Nationally, also, units that were always affordable constituted about one-fifth of the units that were affordable in 1985 (21.3 percent). In New York, the proportion was close to half (47.0 percent). Oakland-San Francisco, Los Angeles, and Northern New Jersey were about the national average; Chicago, Detroit and Philadelphia had between 10 and 15 percent.

In most of these MSAs, assisted housing is a large share of the always affordable rental stock. In New York, assisted housing as of 2005 accounted for over 90 percent of the always affordable stock; in most of the others, the proportion is between 70 percent and 80 percent. Houston is the outlier, at 30 percent.⁶² These numbers cannot be taken too literally, given the apparent overstatement of assisted housing in the AHS, compared to HUD program data. They clearly point up the desirability of matching the AHS sample to HUD program data.

The structural distribution of affordable rental housing varies quite widely (Table 6-5). In New York, almost half the affordable rental stock as of 2013 (43.5 percent) is in buildings containing 50 or more units. In each of the others, it is less than 20 percent. Within these metropolitan areas, the two most common structural types for affordable rental housing are small rental properties – structures with two to four units – or single-family detached homes. (Philadelphia is an exception: single-family attached homes – town houses or row houses – are more common than single-family detached homes.) In Chicago, Northern New Jersey, Philadelphia, and Oakland-San Francisco, small rental properties – structures with two or four units – make up the largest share of the affordable rental stock – about one-third except in Oakland-San Francisco. In Los Angeles and Detroit, which are not commonly thought of as similar cities, single-family detached homes are the most common; they are also a close second to 2-4 unit structures in Oakland-San Francisco.

Differences in structure type correlate with difference in ownership. The Residential Finance Survey conducted by the Census Bureau in 2001 reported that:

- (1) over 90 percent of rental buildings with fewer than four units were owned by individuals;
- (2) over 60 percent of rental buildings with five to 49 units were owned by individuals;

⁶² Assisted units in 1985 exceeded always affordable units in New York, Chicago, and Philadelphia. This occurs partly because of declines in assisted units in these MSAs, and because of the loss of unassisted units that were affordable in 1985.

- (3) fewer than 10 percent of rental buildings with 50 or more units were owned by individuals; the large majority were owned by limited partnerships or corporations.⁶³

The differences between these large metropolitan areas in structure type and ownership of affordable rental housing suggest strongly that policies to assist or preserve affordable rental housing need to be tailored to the local market.

Central Cities

In the remainder for this chapter we focus on the three largest metropolitan areas, and analyze the changes in the central cities (Tables 6-6 to 6-9) and the suburban areas (Tables 6-10 to 6-13). These Metropolitan Statistical Areas are much more narrowly defined than the MSAs in the first three tables.⁶⁴

The Chicago area consists of three counties: Cook (which includes Chicago), DuPage, and McHenry. These counties comprise the Federal Information Processing Standard (FIPS) Code #1600. Other counties adjacent to Cook County are part of the Chicago Consolidated Metropolitan Statistical Area (CMSA)⁶⁵, but not part of the Chicago Primary Metropolitan Statistical Area (PMSA). They are part of other PMSAs: Aurora-Elgin, Gary-Hammond, Joliet, Kenosha, and Lake County (Illinois).

The Los-Angeles-Long Beach MSA consists of Los Angeles County. It is the only county in FIPS Code #4480. Other counties that are part of the Los Angeles CMSA⁶⁶ are in other PMSAs: Anaheim-Santa Ana, Oxnard-Ventura, and Riverside-San Bernardino.

The New York PMSA consists of the five boroughs of New York City, plus three counties in New York: Putnam, Rockland, and Westchester. These counties comprise FIPS Code # 5600. Other counties that are part of the New York CMSA⁶⁷ are in other PMSAs: Bergen-Passaic, Bridgeport-Milford, Danbury, Jersey City, Middlesex-Somerset-Hunterdon, Monmouth-Ocean, Nassau-Suffolk, Newark, Norfolk, Orange County, and Stamford.

It should be noted that there is more than one central city in the Los Angeles MSA. Long Beach has been a central city of the Los Angeles MSA for more than half a century.

⁶³ U.S. Department of Housing and Urban Development and U.S. Bureau of the Census, *Residential Finance Survey: 2001*, Census Special Report R-27 (September 2005). Data on ownership appear in the first table for each size class of building.

⁶⁴ The official 1983 list of metropolitan areas and component counties is available at <http://www.census.gov/population/metro/files/lists/historical/83mfips.txt>.

⁶⁵ Officially, the Chicago-Gary-Lake County IL-IN-WI CMSA. There are two Lake Counties in the CMSA, one in Illinois and the other in Indiana.

⁶⁶ Officially, the Los Angeles-Anaheim-Riverside CMSA.

⁶⁷ Officially, the New York-Northern New Jersey-Long Island, NY-NJ-CT CMSA.

New York and Los Angeles enjoyed double-digit growth in their housing stock between 1985 and 2013; Chicago experienced a more modest decline (Table 6-6). All three had quite large increases in their high-rent stock, approximately doubling in New York and Chicago and growing by 50 percent in Los Angeles. The small stock of URE and seasonal housing units – less than three percent of the stock in each city. All three saw an increase in the owner stock between 1985 and 2005 – barely, in Chicago – followed by a drop between 2005 and 2013, which more than offset the previous increase.

The rental stock increased by more than 25 percent in Los Angeles between 1985 and 2013, and by seven percent in New York. It declined by five percent in Chicago. The affordable rental stock decreased by 66,000 units in Chicago (19.0 percent), much more than either New York (2,000) or Los Angeles (less than 1,000).

Almost 60 percent of the 1985 affordable rental stock in New York was affordable in 2013, far more than in Chicago (37 percent) and Los Angeles (30 percent). New York experienced more gentrification than filtering by 24,000 units, a marked departure from the national pattern; in Los Angeles, gentrification was also more common than filtering, by 10,000 units, also a departure from the country as a whole; in Chicago, filtering exceeded gentrification by 17,000 units. Permanent losses exceeded additions to the stock in New York (by 18,000 units) and Chicago (by 94,000 units); in Los Angeles, additions exceeded losses (by 19,000 units). Tenure changes from affordable rental to owned stock exceeded the reverse in New York (by 15,000 units) and Chicago (by 25,000 units); Los Angeles had no net change. In all three cities, a small number of affordable rental units became URE or seasonal housing. Other changes were smaller.

Over half of the affordable stock in New York consisted of assisted units, compared to less than a quarter in each of the other two cities (Table 6-8). In New York and Los Angeles, the number of assisted units increased modestly, and the number of assisted units (in either year) was slightly larger than the number that were always affordable. In Chicago, which lost 20 percent of its assisted stock between 1985 and 2013, the number that were always affordable was about 80 percent of the number than were assisted in 2013.

A very large share of the 1985 rental stock in each city was sometimes not rental over the next 28 years – close to half in New York and Los Angeles, almost three quarters in Chicago. More than half of those units that were always rental in New York were in the same affordability category throughout the period – mostly always affordable, additional evidence of the scale of New York's assisted housing. In Los Angeles and Chicago, less than 10 percent were always in the same affordability category. Not many units in any city filtered or gentrified monotonically, and in Los Angeles and Chicago, the changes essentially offset each other; in New York, three times as many gentrified as filtered, but the numbers were both small. Neither change in any city exceeded 2.5 percent of the 1985 housing stock. With the exception of New York's affordable and mostly assisted housing stock, No units were always moderate rent in New York; none were always high rent in Chicago. The scarcity of stable patterns in the rental stock is consistent with the unit-years analysis in Chapter 4. Rental housing in general, and affordable rental housing in particular, is provided by housing units which are not always rental and not always affordable, unless they are assisted.

About half of New York's affordable rental housing stock in 2013 consisted of units in buildings with at least 50 units, compared to less than one quarter in Chicago and less than one-fifth in Los Angeles (Table 6-9). In Chicago, over 40 percent were units in structures with two to four units; in Los Angeles, there is no predominant structure type. The patterns are similar for moderate and high rent units. Over one-third in New York are in the largest structures; less than one quarter in Chicago; only about 15 percent in Los Angeles. In Chicago, more than one-third were in structures with two to four units; in New York, almost one quarter were in such structures. Again, in Los Angeles there is no predominant structure type among these higher rent units.

Suburbs

The most interesting fact about the housing stock in the suburbs of these three largest metropolitan areas is that the stock of affordable rental housing increased in all of them between 1985 and 2013 (Table 6-10). Around Chicago, the increase was 68,000 (just over 100 percent); around New York, 29,000 (50 percent); around Los Angeles, 22,000 (over 25 percent). The affordable rental share of the stock also increased in the suburbs of each metropolitan area, although it was not especially large in any of them; in the suburbs, owner-occupied housing predominated throughout the period.

Around Chicago, the suburban affordable rental stock increased both during 1985-2005 and 2005-2013, and the affordable rental *share* of the stock also increased during both periods, despite the homeownership boom. Around New York, declined between 1985 and 2005, then rose sharply between 2005 and 2013; around Los Angeles, the reverse was true. Changes for the higher rent category showed no consistent pattern.

In all three suburban areas, the largest source of additional affordable rental housing was higher rent housing (Table 6-11). Around Chicago, all of the units that filtered were moderate rental in 1985; around Los Angeles, moderate and high rental units were about equally important; around New York, high rental was more common. Only around Chicago were the changes consistent with the national pattern. Losses of affordable rental housing were mainly permanent losses to the housing stock around New York; around Los Angeles and Chicago, gentrification was. Around Los Angeles and Chicago, additions to the stock of affordable rental units exceeded permanent losses; around New York, losses exceed additions. In all three, also, changes from owned stock to affordable rental exceeded the movement in the opposite direction. Around Chicago, the increase in the affordable rental stock came about equally from units that filtered and units that were part of the owner stock in 1985. Tenure changes were much less important around the other two.

Very little of the suburban affordable rental stock was assisted in 1985 (Table 6-12). Between 1985 and 2013, assisted units accounted for more than the net increase in affordable units. Around Los Angeles and Chicago, there was virtually no change in the number of assisted units. Around New York, nearly all of the units that were affordable in both 1985 and 2013 were always affordable, compared to half around Los Angeles and one-third around Chicago. But

there were not that many units around any of these cities that were affordable in both 1985 and 2013.

In the suburbs of each area as well as in the central cities, a large share of the 1985 rental stock in each city was sometimes not rental in the ensuing years – about half in each case. Of those units that were always rental, about 15 percent were always affordable around New York. Very few around either Los Angeles or Chicago were always in the same affordability category. No units were always moderate rent around New York; none were always high rent around Chicago. No rental units around New York gentrified between 1985 and 2013. The scarcity of stable patterns in the rental stock is consistent with the unit-years analysis in Chapter 4. Rental housing in general, and affordable rental housing in particular have been provided by housing units which were not always rental and not always affordable. These statements are as true in the suburbs as in the central cities.

Affordable rental units in the suburbs are commonly found in smaller structures. Around New York, large buildings, with 50 or more units, were the most common structure type in 2013. Around Los Angeles, it was a single-family detached home; around Chicago, buildings with five to nine units – the “six-flats” found in many neighborhoods. although units in structures with five to nine units are almost as common around Chicago as single-family homes. Higher rent units are most frequently in single-family detached homes around Los Angeles, buildings with two to four units around New York, buildings with five to nine units around Chicago, they are almost as frequent as units in structures with five to nine units. Almost no higher rent units around New York are in very large structures: only 2,000, compared to 29,000 around Chicago and 61,000 around Los Angeles.

Table 6-2a: Composition of the Housing Stock: 1985-2013

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL)		Chicago MSA	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2013 Housing Stock								
Affordable rentals	836,000	17.2%	438,000	8.4%	498,000	15.5%	416,000	17.8%
Moderate rentals	474,000	9.7%	985,000	19.0%	451,000	14.0%	382,000	16.3%
High rent rentals	1,182,000	24.3%	1,130,000	21.7%	223,000	6.9%	172,000	7.3%
All rentals	2,491,000	51.2%	2,554,000	49.1%	1,172,000	36.4%	970,000	41.4%
Owner stock	2,096,000	43.1%	2,445,000	47.1%	1,914,000	59.5%	1,270,000	54.3%
URE/seasonal	280,000	5.7%	198,000	3.8%	132,000	4.1%	101,000	4.3%
Housing stock	4,867,000	100.0%	5,197,000	100.0%	3,218,000	100.0%	2,341,000	100.0%
1985 Housing Stock								
Affordable rentals	757,000	17.3%	339,000	7.5%	454,000	16.6%	414,000	17.8%
Moderate rentals	873,000	20.0%	806,000	17.8%	454,000	16.5%	399,000	17.2%
High rent rentals	709,000	16.2%	932,000	20.6%	125,000	4.6%	118,000	5.1%
All rentals	2,339,000	53.5%	2,078,000	45.9%	1,033,000	37.7%	931,000	40.1%
Owner stock	1,874,000	42.8%	2,353,000	52.0%	1,651,000	60.2%	1,348,000	58.0%
URE/seasonal	160,000	3.7%	97,000	2.1%	60,000	2.2%	44,000	1.9%
Housing stock	4,374,000	100.0%	4,528,000	100.0%	2,744,000	100.0%	2,323,000	100.0%
Change 1985-2013								
Affordable rentals	79,000	10.5%	100,000	29.4%	44,000	9.6%	2,000	0.5%
Moderate rentals	-399,000	-45.8%	179,000	22.2%	-3,000	-0.7%	-17,000	-4.3%
High rent rentals	472,000	66.6%	197,000	21.2%	98,000	78.5%	54,000	45.8%
All rentals	152,000	6.5%	476,000	22.9%	139,000	13.4%	39,000	4.2%
Owner stock	222,000	11.9%	92,000	3.9%	263,000	15.9%	-77,000	-5.7%
URE/seasonal	119,000	74.4%	101,000	103.4%	73,000	121.9%	57,000	131.4%
Housing stock	494,000	11.3%	669,000	14.8%	474,000	17.3%	19,000	0.8%

Table 6-2a (continued): Composition of the Housing Stock: 1985-2013

	Northern New Jersey		Philadelphia		Detroit		Greater Oakland-San Francisco	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2013 Housing Stock								
Affordable rentals	363,000	13.3%	290,000	13.5%	228,000	12.0%	347,000	15.2%
Moderate rentals	422,000	15.4%	275,000	12.8%	248,000	13.1%	453,000	19.9%
High rent rentals	128,000	4.7%	74,000	3.4%	47,000	2.5%	215,000	9.4%
All rentals	913,000	33.4%	639,000	29.8%	523,000	27.6%	1,015,000	44.5%
Owner stock	1,654,000	60.5%	1,434,000	66.9%	1,223,000	64.6%	1,199,000	52.6%
URE/seasonal	166,000	6.1%	72,000	3.4%	148,000	7.8%	65,000	2.8%
Housing stock	2,733,000	100.0%	2,146,000	100.0%	1,893,000	100.0%	2,279,000	100.0%
1985 Housing Stock								
Affordable rentals	303,000	12.7%	262,000	13.3%	290,000	16.6%	188,000	9.5%
Moderate rentals	432,000	18.1%	246,000	12.5%	222,000	12.7%	338,000	17.1%
High rent rentals	194,000	8.1%	149,000	7.6%	38,000	2.2%	343,000	17.3%
All rentals	930,000	38.9%	657,000	33.5%	549,000	31.5%	868,000	43.9%
Owner stock	1,368,000	57.2%	1,274,000	64.9%	1,163,000	66.8%	1,076,000	54.5%
URE/seasonal	95,000	4.0%	33,000	1.7%	29,000	1.7%	32,000	1.6%
Housing stock	2,392,000	100.0%	1,963,000	100.0%	1,741,000	100.0%	1,976,000	100.0%
Change 1985-2013								
Affordable rentals	60,000	19.8%	29,000	10.9%	-62,000	-21.4%	159,000	84.7%
Moderate rentals	-10,000	-2.4%	29,000	11.6%	27,000	12.0%	115,000	34.1%
High rent rentals	-66,000	-34.1%	-75,000	-50.6%	9,000	23.7%	-128,000	-37.3%
All rentals	-17,000	-1.8%	-18,000	-2.8%	-26,000	-4.8%	146,000	16.9%
Owner stock	286,000	20.9%	161,000	12.6%	60,000	5.1%	123,000	11.4%
URE/seasonal	72,000	76.0%	40,000	121.8%	118,000	403.7%	33,000	104.9%
Housing stock	341,000	14.2%	182,000	9.3%	152,000	8.7%	302,000	15.3%

Table 6-2b: Interim Changes in the Housing Stock: 1985-2005 & 2005-2013

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL)		Chicago MSA	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2005 Housing Stock								
Affordable rentals	773,000	16.2%	373,000	7.4%	461,000	14.6%	401,000	16.9%
Moderate rentals	638,000	13.4%	960,000	18.9%	436,000	13.8%	385,000	16.3%
High rent rentals	1,007,000	21.1%	920,000	18.2%	115,000	3.6%	102,000	4.3%
All rentals	2,418,000	50.7%	2,253,000	44.4%	1,011,000	32.0%	888,000	37.5%
Owner stock	2,149,000	45.0%	2,682,000	52.9%	2,083,000	65.9%	1,428,000	60.3%
URE/seasonal	203,000	4.3%	134,000	2.6%	66,000	2.1%	51,000	2.1%
Housing stock	4,769,000	100.0%	5,068,000	100.0%	3,161,000	100.0%	2,367,000	100.0%
Change: 1985-2005								
Affordable rentals	16,000	2.1%	34,000	10.0%	6,000	1.4%	-13,000	-3.2%
Moderate rentals	-235,000	-27.0%	153,000	19.0%	-18,000	-4.0%	-14,000	-3.5%
High rent rentals	298,000	42.0%	-12,000	-1.3%	-10,000	-8.4%	-15,000	-13.1%
All rentals	79,000	3.4%	175,000	8.4%	-22,000	-2.2%	-43,000	-4.6%
Owner stock	274,000	14.6%	329,000	14.0%	432,000	26.2%	80,000	5.9%
URE/seasonal	43,000	26.7%	37,000	37.7%	7,000	11.5%	7,000	15.9%
Housing stock	396,000	9.0%	541,000	11.9%	416,000	15.2%	44,000	1.9%
Change: 2005-2013								
Affordable rentals	63,000	8.2%	66,000	17.6%	37,000	8.1%	15,000	3.8%
Moderate rentals	-164,000	-25.7%	26,000	2.7%	15,000	3.5%	-3,000	-0.8%
High rent rentals	175,000	17.3%	210,000	22.8%	109,000	94.8%	69,000	67.8%
All rentals	74,000	3.0%	301,000	13.4%	161,000	16.0%	82,000	9.2%
Owner stock	-52,000	-2.4%	-236,000	-8.8%	-169,000	-8.1%	-157,000	-11.0%
URE/seasonal	77,000	37.7%	64,000	47.8%	66,000	99.0%	50,000	99.6%
Housing stock	98,000	2.1%	128,000	2.5%	58,000	1.8%	-25,000	-1.1%

Table 6-2b (continued): Interim Changes in the Housing Stock: 1985-2005 & 2005-2013

	Northern New Jersey		Philadelphia		Detroit		Greater Oakland-San Francisco	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2005 Housing Stock								
Affordable rentals	379,000	14.0%	264,000	12.5%	283,000	14.8%	313,000	14.0%
Moderate rentals	372,000	13.7%	275,000	13.0%	161,000	8.4%	414,000	18.5%
High rent rentals	99,000	3.6%	39,000	1.8%	18,000	0.9%	142,000	6.3%
All rentals	850,000	31.3%	578,000	27.3%	462,000	24.1%	869,000	38.8%
Owner stock	1,740,000	64.0%	1,474,000	69.5%	1,372,000	71.7%	1,322,000	59.1%
URE/seasonal	128,000	4.7%	68,000	3.2%	80,000	4.2%	47,000	2.1%
Housing stock	2,718,000	100.0%	2,120,000	100.0%	1,914,000	100.0%	2,238,000	100.0%
Change: 1985-2005								
Affordable rentals	76,000	25.1%	2,000	0.9%	-7,000	-2.3%	125,000	66.5%
Moderate rentals	-60,000	-13.8%	29,000	11.9%	-61,000	-27.4%	76,000	22.6%
High rent rentals	-96,000	-49.2%	-111,000	-74.1%	-20,000	-52.7%	-201,000	-58.5%
All rentals	-79,000	-8.5%	-79,000	-12.0%	-88,000	-15.9%	1,000	0.1%
Owner stock	371,000	27.1%	200,000	15.7%	210,000	18.0%	246,000	22.8%
URE/seasonal	33,000	34.9%	35,000	107.4%	50,000	171.2%	16,000	49.4%
Housing stock	325,000	13.6%	156,000	8.0%	172,000	9.9%	262,000	13.3%
Change: 2005-2013								
Affordable rentals	-16,000	-4.3%	26,000	10.0%	-55,000	-19.5%	34,000	10.9%
Moderate rentals	49,000	13.3%	-1,000	-0.3%	87,000	54.3%	39,000	9.3%
High rent rentals	29,000	29.7%	35,000	90.8%	29,000	161.7%	73,000	51.2%
All rentals	62,000	7.3%	61,000	10.5%	61,000	13.2%	146,000	16.8%
Owner stock	-86,000	-4.9%	-40,000	-2.7%	-150,000	-10.9%	-123,000	-9.3%
URE/seasonal	39,000	30.5%	5,000	6.9%	68,000	85.7%	18,000	37.2%
Housing stock	16,000	0.6%	26,000	1.2%	-21,000	-1.1%	40,000	1.8%

Table 6-3: Forward-Looking and Backward-Looking Analysis (MSAs)**WHAT HAPPENED TO THE 1985 AFFORDABLE RENTAL STOCK?**

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL only)		Chicago MSA	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Was affordable in 2013	443,000	58.5%	111,000	32.8%	177,000	39.0%	161,000	38.9%
To moderate rental	51,000	6.7%	77,000	22.9%	56,000	12.2%	53,000	12.9%
To high rental	113,000	15.0%	58,000	17.0%	18,000	3.9%	18,000	4.3%
Gentrified	164,000	21.7%	135,000	39.8%	73,000	16.2%	71,000	17.2%
Changed tenure	38,000	5.0%	40,000	11.8%	37,000	8.2%	31,000	7.4%
Became URE/seasonal	13,000	1.7%	14,000	4.2%	19,000	4.2%	19,000	4.6%
Temporary lost to stock	4,000	0.6%	0	0.0%	4,000	1.0%	4,000	1.1%
Permanent loss	95,000	12.5%	38,000	11.3%	143,000	31.4%	127,000	30.8%
1985 affordable stock	757,000	100.0%	339,000	100.0%	454,000	100.0%	414,000	100.0%

WHERE DID THE 2013 AFFORDABLE STOCK COME FROM?

Were added to the stock	104,000	12.4%	97,000	22.0%	66,000	13.2%	39,000	9.4%
Were affordable in 1985	443,000	52.9%	111,000	25.4%	177,000	35.6%	161,000	38.7%
From moderate rental	115,000	13.7%	91,000	20.7%	124,000	24.9%	108,000	25.9%
From high rental	78,000	9.3%	61,000	14.0%	9,000	1.8%	7,000	1.6%
Filtered	193,000	23.0%	152,000	34.7%	133,000	26.7%	115,000	27.6%
Changed tenure	73,000	8.7%	74,000	16.8%	109,000	21.8%	92,000	22.1%
Were URE/seasonal	4,000	0.5%	2,000	0.5%	4,000	0.9%	2,000	0.6%
Were temporarily lost in 1985	20,000	2.4%	2,000	0.5%	9,000	1.8%	7,000	1.6%
2013 affordable stock	836,000	100.0%	438,000	100.0%	498,000	100.0%	416,000	100.0%

Table 6-3 (continued): Forward-Looking and Backward-Looking Analysis (MSAs)**WHAT HAPPENED TO THE 1985 AFFORDABLE RENTAL STOCK?**

	Northern New Jersey		Philadelphia		Detroit		Greater Oakland-San Francisco	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Was affordable in 2013	126,000	41.6%	80,000	30.6%	76,000	26.1%	83,000	44.1%
To moderate rental	52,000	17.0%	21,000	8.0%	33,000	11.4%	35,000	18.7%
To high rental	7,000	2.3%	7,000	2.6%	0	0.0%	0	0.0%
Gentrified	58,000	19.3%	28,000	10.6%	33,000	11.4%	35,000	18.7%
Changed tenure	47,000	15.4%	51,000	19.6%	36,000	12.4%	30,000	15.9%
Became URE/seasonal	9,000	3.0%	12,000	4.5%	23,000	7.9%	5,000	2.6%
Temporary lost to stock	9,000	3.0%	2,000	0.9%	7,000	2.4%	2,000	1.1%
Permanent loss	53,000	17.6%	88,000	33.8%	115,000	39.8%	33,000	17.6%
1985 affordable stock	303,000	100.0%	262,000	100.0%	290,000	100.0%	188,000	100.0%

WHERE DID THE 2013 AFFORDABLE STOCK COME FROM?

Were added to the stock	34,000	9.5%	30,000	10.4%	25,000	11.1%	65,000	18.6%
Were affordable in 1985	126,000	34.8%	80,000	27.6%	76,000	33.2%	83,000	23.9%
From moderate rental	133,000	36.7%	61,000	21.1%	43,000	19.1%	99,000	28.6%
From high rental	23,000	6.3%	36,000	12.4%	7,000	3.1%	41,000	11.8%
Filtered	156,000	43.1%	97,000	33.5%	50,000	22.1%	140,000	40.4%
Changed tenure	37,000	10.1%	78,000	26.9%	69,000	30.5%	53,000	15.3%
Were URE/seasonal	2,000	0.6%	5,000	1.6%	5,000	2.1%	0	0.0%
Were temporarily lost in 1985	7,000	2.0%	0	0.0%	2,000	1.0%	7,000	1.9%
2013 affordable stock	363,000	100.0%	290,000	100.0%	228,000	100.0%	347,000	100.0%

Table 6-4. Affordable and Assisted (MSAs)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL only)		Chicago MSA	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
CONTRIBUTION OF ASSISTED HOUSING (BY 1985)								
Affordable rental in 1985	757,000		339,000		454,000		414,000	
Assisted	377,000	49.8%	78,000	23.0%	83,000	18.3%	76,000	18.4%
Affordable in 2013	836,000		438,000		498,000		416,000	
Assisted	392,000	46.9%	89,000	20.2%	75,000	15.1%	64,000	15.3%
HISTORY OF UNITS AFFORDABLE IN BOTH 1985 AND 2013								
Always affordable	356,000	80.5%	76,000	68.6%	60,000	33.7%	53,000	32.6%
Always rental but not always affordable	34,000	7.8%	19,000	16.8%	36,000	20.5%	32,000	19.6%
Sometimes not rental	52,000	11.7%	16,000	14.6%	81,000	45.8%	77,000	47.7%
Affordable in 1985 & 2013	443,000	100.0%	111,000	100.0%	177,000	100.0%	161,000	100.0%
HISTORY OF THE 1985 RENTAL STOCK								
Always affordable	356,000	15.2%	76,000	3.7%	60,000	5.8%	53,000	5.6%
Always moderate	0	0.0%	54,000	2.6%	15,000	1.4%	15,000	1.6%
Always high	36,000	1.5%	44,000	2.1%	0	0.0%	0	0.0%
Filtered down monotonically	18,000	0.8%	52,000	2.5%	18,000	1.8%	16,000	1.7%
Filtered up monotonically	27,000	1.2%	45,000	2.2%	7,000	0.7%	7,000	0.7%
Always rental	707,000	30.2%	821,000	39.5%	245,000	23.7%	229,000	24.6%
Sometimes not rental	1,195,000	51.1%	986,000	47.5%	689,000	66.7%	613,000	65.8%
1985 rental stock	2,339,000	100.0%	2,078,000	100.0%	1,033,000	100.0%	931,000	100.0%

Table 6-4 (continued): Affordable and Assisted (MSAs)

	Northern New Jersey		Philadelphia		Detroit		Greater Oakland-San Francisco	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
CONTRIBUTION OF ASSISTED HOUSING								
Affordable rental in 1985	303,000		262,000		290,000		188,000	
Assisted	73,000	24.0%	44,000	16.8%	43,000	14.9%	62,000	33.2%
Affordable in 2013	363,000		290,000		228,000		347,000	
Assisted	79,000	21.7%	32,000	11.1%	45,000	20.0%	50,000	14.5%
HISTORY OF UNITS AFFORDABLE IN BOTH 1985 AND 2013								
Always affordable	66,000	52.4%	28,000	34.8%	41,000	54.0%	46,000	55.5%
Always rental but not always affordable	22,000	17.4%	19,000	23.3%	12,000	15.5%	18,000	22.2%
Sometimes not rental	38,000	30.2%	34,000	42.0%	23,000	30.5%	18,000	22.3%
Affordable in 1985 & 2013	126,000	100.0%	80,000	100.0%	76,000	100.0%	83,000	100.0%
HISTORY OF THE 1985 RENTAL STOCK								
Always affordable	66,000	7.1%	28,000	4.2%	41,000	7.4%	46,000	5.3%
Always moderate	21,000	2.2%	21,000	3.1%	5,000	0.8%	7,000	0.8%
Always high	0	0.0%	0	0.0%	0	0.0%	2,000	0.2%
Filtered down monotonically	32,000	3.4%	13,000	2.0%	9,000	1.7%	34,000	4.0%
Filtered up monotonically	5,000	0.5%	7,000	1.0%	2,000	0.4%	5,000	0.5%
Always rental	258,000	27.8%	139,000	21.2%	94,000	17.2%	291,000	33.5%
Sometimes not rental	549,000	59.0%	449,000	68.4%	398,000	72.4%	483,000	55.7%
1985 rental stock	930,000	100.0%	657,000	100.0%	549,000	100.0%	868,000	100.0%

Table 6-5: Rental Housing by Structure and Size in 2013 (MSAs)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL only)		Chicago MSA	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Moderate and high rentals in 2013								
Mobile homes	0	0.0%	7,000	0.3%	4,000	0.5%	4,000	0.6%
Single-family, detached	96,000	5.8%	480,000	22.7%	101,000	15.1%	55,000	9.8%
Single-family, attached	43,000	2.6%	154,000	7.3%	40,000	6.0%	23,000	4.1%
2-4 unit structures	401,000	24.2%	325,000	15.4%	174,000	25.8%	150,000	27.2%
5-9 unit structures	141,000	8.5%	359,000	17.0%	119,000	17.7%	117,000	21.1%
10-19 unit structures	133,000	8.0%	264,000	12.5%	57,000	8.4%	52,000	9.4%
20-49 unit structures	329,000	19.9%	268,000	12.7%	52,000	7.7%	50,000	9.0%
50+ unit structures	512,000	30.9%	258,000	12.2%	127,000	18.8%	104,000	18.8%
Total	1,656,000	100.0%	2,115,000	100.0%	674,000	100.0%	554,000	100.0%
Affordable rental in 2013								
Mobile homes	0	0.0%	5,000	1.1%	4,000	0.8%	4,000	0.9%
Single-family, detached	48,000	5.7%	112,000	25.6%	68,000	13.6%	36,000	8.7%
Single-family, attached	20,000	2.4%	12,000	2.7%	18,000	3.7%	13,000	3.1%
2-4 unit structures	145,000	17.3%	92,000	20.9%	169,000	33.9%	142,000	34.2%
5-9 unit structures	36,000	4.3%	65,000	14.9%	88,000	17.6%	81,000	19.4%
10-19 unit structures	34,000	4.1%	37,000	8.5%	29,000	5.8%	25,000	6.0%
20-49 unit structures	191,000	22.8%	55,000	12.6%	36,000	7.2%	34,000	8.1%
50+ unit structures	363,000	43.5%	60,000	13.7%	87,000	17.5%	81,000	19.5%
Total	836,000	100.0%	438,000	100.0%	498,000	100.0%	416,000	100.0%

Table 6-5 (continued): Rental Housing by Structure and Size in 2013 (MSAs)

	Northern New Jersey		Philadelphia		Detroit		Greater Oakland-San Francisco	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Moderate and high rentals in 2013								
Mobile homes	0	0.0%	0	0.0%	4,000	1.2%	3,000	0.5%
Single-family, detached	55,000	10.1%	31,000	8.9%	112,000	38.0%	158,000	23.6%
Single-family, attached	24,000	4.4%	76,000	21.8%	26,000	9.0%	44,000	6.6%
2-4 unit structures	188,000	34.3%	95,000	27.2%	20,000	6.7%	150,000	22.5%
5-9 unit structures	88,000	16.1%	23,000	6.6%	49,000	16.8%	89,000	13.4%
10-19 unit structures	73,000	13.2%	68,000	19.5%	46,000	15.5%	74,000	11.1%
20-49 unit structures	78,000	14.2%	27,000	7.8%	16,000	5.4%	70,000	10.5%
50+ unit structures	43,000	7.8%	29,000	8.2%	22,000	7.6%	80,000	11.9%
Total	550,000	100.0%	348,000	100.0%	295,000	100.0%	668,000	100.0%
Affordable rental in 2013								
Mobile homes	0	0.0%	0	0.0%	0	0.0%	5,000	1.4%
Single-family, detached	31,000	8.5%	31,000	10.8%	77,000	33.9%	71,000	20.5%
Single-family, attached	19,000	5.3%	85,000	29.2%	12,000	5.4%	11,000	3.1%
2-4 unit structures	122,000	33.5%	88,000	30.2%	42,000	18.6%	78,000	22.5%
5-9 unit structures	69,000	19.0%	15,000	5.0%	32,000	14.1%	59,000	17.1%
10-19 unit structures	37,000	10.3%	23,000	8.0%	16,000	7.0%	32,000	9.1%
20-49 unit structures	34,000	9.5%	19,000	6.6%	14,000	6.0%	40,000	11.6%
50+ unit structures	51,000	13.9%	30,000	10.3%	34,000	15.0%	51,000	14.7%
Total	363,000	100.0%	290,000	100.0%	228,000	100.0%	347,000	100.0%

Table 6-6a. Composition of the Housing Stock: 1985-2013 (Central Cities)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL)	
	Number	Percent	Number	Percent	Number	Percent
2013 Housing Stock						
Affordable rentals	641,000	19.8%	237,000	10.3%	319,000	22.8%
Moderate rentals	359,000	11.1%	507,000	22.0%	234,000	16.8%
High rent rentals	1,119,000	34.5%	616,000	26.8%	143,000	10.2%
All rentals	2,120,000	65.4%	1,360,000	59.1%	696,000	49.8%
Owner stock	960,000	29.6%	865,000	37.6%	641,000	45.9%
URE/seasonal	161,000	5.0%	76,000	3.3%	60,000	4.3%
Housing stock	3,241,000	100.0%	2,300,000	100.0%	1,397,000	100.0%
1985 Housing Stock						
Affordable rentals	646,000	22.1%	221,000	11.3%	368,000	27.3%
Moderate rentals	755,000	25.8%	402,000	20.6%	251,000	18.6%
High rent rentals	570,000	19.5%	423,000	21.7%	67,000	5.0%
All rentals	1,972,000	67.4%	1,046,000	53.6%	686,000	50.9%
Owner stock	871,000	29.8%	859,000	44.0%	624,000	46.2%
URE/seasonal	83,000	2.8%	46,000	2.3%	39,000	2.9%
Housing stock	2,926,000	100.0%	1,951,000	100.0%	1,349,000	100.0%
Change 1985-2013						
Affordable rentals	-5,000	-0.8%	16,000	7.3%	-50,000	-13.5%
Moderate rentals	-396,000	-52.5%	104,000	26.0%	-16,000	-6.4%
High rent rentals	549,000	96.3%	193,000	45.6%	76,000	112.5%
All rentals	148,000	7.5%	313,000	30.0%	10,000	1.4%
Owner stock	89,000	10.2%	5,000	0.6%	17,000	2.7%
URE/seasonal	78,000	94.1%	30,000	66.3%	21,000	54.0%
Housing stock	315,000	10.8%	349,000	17.9%	48,000	3.5%

Table 6-6b: Interim Changes in the Housing Stock: 1985-2005 & 2005-2013 (Central Cities)

2005 Housing Stock	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL)	
	Number	Percent	Number	Percent	Number	Percent
Affordable rentals	632,000	19.9%	186,000	8.5%	320,000	23.2%
Moderate rentals	526,000	16.6%	490,000	22.3%	245,000	17.8%
High rent rentals	903,000	28.4%	505,000	23.0%	58,000	4.2%
All rentals	2,061,000	64.9%	1,182,000	53.8%	622,000	45.2%
Owner stock	1,009,000	31.8%	949,000	43.2%	723,000	52.5%
URE/seasonal	108,000	3.4%	66,000	3.0%	32,000	2.3%
Housing stock	3,178,000	100.0%	2,197,000	100.0%	1,377,000	100.0%
Change: 1985-2005						
Affordable rentals	-14,000	-2.2%	-35,000	-15.6%	-49,000	-13.3%
Moderate rentals	-229,000	-30.4%	88,000	21.9%	-6,000	-2.2%
High rent rentals	333,000	58.4%	82,000	19.4%	-10,000	-14.4%
All rentals	89,000	4.5%	136,000	13.0%	-64,000	-9.3%
Owner stock	139,000	15.9%	89,000	10.4%	99,000	15.9%
URE/seasonal	25,000	29.5%	20,000	44.7%	-7,000	-18.5%
Housing stock	252,000	8.6%	246,000	12.6%	28,000	2.0%
Change: 2005-2013						
Affordable rentals	9,000	1.5%	51,000	27.2%	-1,000	-0.3%
Moderate rentals	-167,000	-31.8%	16,000	3.3%	-11,000	-4.3%
High rent rentals	216,000	23.9%	111,000	21.9%	85,000	148.3%
All rentals	58,000	2.8%	178,000	15.0%	74,000	11.9%
Owner stock	-49,000	-4.9%	-84,000	-8.9%	-82,000	-11.3%
URE/seasonal	54,000	49.9%	10,000	14.9%	28,000	89.0%
Housing stock	63,000	2.0%	103,000	4.7%	20,000	1.5%

Table 6-7: Forward-Looking and Backward-Looking Analysis (Central Cities)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL only)	
	Number	Percent	Number	Percent	Number	Percent
Were affordable in 2013	386,000	59.8%	72,000	32.7%	137,000	37.1%
To moderate rental	50,000	7.8%	56,000	25.4%	44,000	12.1%
To high rental	106,000	16.5%	26,000	11.7%	13,000	3.6%
Gentrified	157,000	24.3%	82,000	37.2%	58,000	15.6%
Changed tenure	28,000	4.4%	23,000	10.4%	30,000	8.3%
Became URE/seasonal	3,000	0.4%	12,000	5.5%	17,000	4.6%
Temporary lost to stock	4,000	0.7%	0	0.0%	2,000	0.6%
Permanent loss	68,000	10.5%	31,000	14.2%	124,000	33.8%
1985 affordable stock	646,000	100.0%	221,000	100.0%	368,000	100.0%
Were added to the stock	58,000	9.0%	53,000	22.3%	34,000	10.8%
Were affordable in 1985	386,000	60.3%	72,000	30.5%	137,000	43.0%
From moderate rental	87,000	13.6%	47,000	19.9%	72,000	22.5%
From high rental	45,000	7.0%	29,000	12.4%	9,000	2.8%
Filtered	133,000	20.7%	77,000	32.3%	81,000	25.3%
Changed tenure	43,000	6.7%	33,000	14.0%	58,000	18.1%
Were URE/seasonal	2,000	0.4%	0	0.0%	0	0.0%
Were temporarily lost in 1985	20,000	3.1%	2,000	0.9%	9,000	2.8%
2013 affordable stock	641,000	100.0%	237,000	100.0%	319,000	100.0%

Table 6-8: Affordable and Assisted (Central Cities)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (Illinois only)	
	Number	Percent	Number	Percent	Number	Percent
CONTRIBUTION OF ASSISTED HOUSING						
Affordable rental in 1985	646,000		221,000		368,000	
Assisted	330,000	51.1%	53,000	23.9%	70,000	19.0%
Affordable in 2013	641,000		237,000		319,000	
Assisted	343,000	53.5%	57,000	24.2%	61,000	19.1%
HISTORY OF UNITS AFFORDABLE IN BOTH 1985 AND 2013						
Always affordable	310,000	80.2%	51,000	71.2%	46,000	33.9%
Always rental but not always affordable	27,000	7.1%	11,000	15.8%	23,000	16.7%
Sometimes not rental	49,000	12.8%	9,000	13.0%	68,000	49.4%
Affordable in 1985 & 2013	386,000	100.0%	72,000	100.0%	137,000	100.0%
HISTORY OF THE 1985 RENTAL STOCK						
Always affordable	310,000	15.7%	51,000	4.9%	46,000	6.8%
Always moderate	0	0.0%	18,000	1.8%	7,000	1.0%
Always high	36,000	2.2%	25,000	2.4%	0	0.0%
Filtered down monotonically	9,000	0.5%	29,000	2.7%	7,000	1.0%
Filtered up monotonically	27,000	1.7%	21,000	2.0%	4,000	0.7%
Always rental	630,000	32.6%	435,000	41.6%	133,000	19.4%
Sometimes not rental	960,000	47.4%	466,000	44.5%	488,000	71.2%
1985 rental stock	1,972,000	100.0%	1,046,000	100.0%	686,000	100.0%

Table 6-9: Rental Housing by Structure and Size in 2013 (Central Cities)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL only)	
	Number	Percent	Number	Percent	Number	Percent
Moderate and high rentals in 2013						
Mobile homes	0	0.0%	0	0.0%	4,000	0.9%
Single-family, detached	43,000	2.9%	185,000	16.5%	41,000	10.9%
Single-family, attached	35,000	2.3%	63,000	5.6%	11,000	2.9%
2-4 unit structures	356,000	24.1%	162,000	14.4%	130,000	34.5%
5-9 unit structures	114,000	7.7%	208,000	18.5%	59,000	15.5%
10-19 unit structures	108,000	7.3%	144,000	12.9%	23,000	6.1%
20-49 unit structures	316,000	21.4%	188,000	16.8%	16,000	4.2%
50+ unit structures	507,000	34.3%	172,000	15.4%	94,000	24.9%
Total	1,478,000	100.0%	1,123,000	100.0%	377,000	100.0%
Affordable rental in 2013						
Mobile homes	0	0.0%	0	0.0%	4,000	1.2%
Single-family, detached	7,000	1.1%	49,000	20.8%	20,000	6.3%
Single-family, attached	11,000	1.8%	6,000	2.7%	11,000	3.5%
2-4 unit structures	78,000	12.2%	52,000	21.8%	135,000	42.4%
5-9 unit structures	25,000	3.8%	41,000	17.4%	43,000	13.4%
10-19 unit structures	22,000	3.4%	17,000	7.2%	16,000	5.1%
20-49 unit structures	179,000	28.0%	31,000	13.3%	16,000	5.0%
50+ unit structures	318,000	49.6%	40,000	16.9%	74,000	23.1%
Total	641,000	100.0%	237,000	100.0%	319,000	100.0%

Table 6-10a: Composition of the Housing Stock: 1985-2013 (Suburbs)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (Illinois only)	
	Number	Percent	Number	Percent	Number	Percent
2013 Housing Stock						
Affordable rentals	195,000	12.0%	202,000	7.0%	179,000	9.9%
Moderate rentals	115,000	7.1%	479,000	16.5%	216,000	11.9%
High rent rentals	62,000	3.8%	514,000	17.7%	80,000	4.4%
All rentals	372,000	22.9%	1,194,000	41.2%	476,000	26.1%
Owner stock	1,136,000	69.9%	1,581,000	54.6%	1,273,000	69.9%
URE/seasonal	118,000	7.3%	122,000	4.2%	72,000	4.0%
Housing stock	1,627,000	100.0%	2,897,000	100.0%	1,822,000	100.0%
1985 Housing Stock						
Affordable rentals	110,000	7.6%	118,000	4.6%	86,000	6.1%
Moderate rentals	118,000	8.1%	404,000	15.7%	204,000	14.6%
High rent rentals	139,000	9.6%	509,000	19.8%	58,000	4.1%
All rentals	367,000	25.4%	1,031,000	40.0%	347,000	24.9%
Owner stock	1,003,000	69.3%	1,494,000	58.0%	1,028,000	73.7%
URE/seasonal	77,000	5.3%	52,000	2.0%	20,000	1.5%
Housing stock	1,448,000	100.0%	2,577,000	100.0%	1,395,000	100.0%
Change 1985-2013						
Affordable rentals	84,000	76.5%	83,000	70.7%	94,000	109.1%
Moderate rentals	-3,000	-2.6%	75,000	18.4%	13,000	6.4%
High rent rentals	-77,000	-55.1%	5,000	0.9%	22,000	38.9%
All rentals	5,000	1.2%	163,000	15.8%	129,000	37.2%
Owner stock	133,000	13.3%	87,000	5.8%	246,000	23.9%
URE/seasonal	41,000	53.3%	70,000	136.4%	52,000	251.6%
Housing stock	179,000	12.3%	320,000	12.4%	426,000	30.6%

Table 6-10b: Interim Changes in the Housing Stock: 1985-2005 & 2005-2013 (Suburbs)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL)	
	Number	Percent	Number	Percent	Number	Percent
2005 Housing Stock						
Affordable rentals	141,000	8.8%	187,000	6.5%	141,000	7.9%
Moderate rentals	112,000	7.0%	470,000	16.4%	191,000	10.7%
High rent rentals	104,000	6.5%	415,000	14.4%	57,000	3.2%
All rentals	356,000	22.4%	1,071,000	37.3%	389,000	21.8%
Owner stock	1,139,000	71.6%	1,733,000	60.4%	1,361,000	76.3%
URE/seasonal	95,000	6.0%	68,000	2.4%	35,000	1.9%
Housing stock	1,591,000	100.0%	2,872,000	100.0%	1,784,000	100.0%
Change: 1985-2005						
Affordable rentals	30,000	27.5%	69,000	58.1%	55,000	64.3%
Moderate rentals	-6,000	-5.0%	65,000	16.2%	-13,000	-6.3%
High rent rentals	-35,000	-25.4%	-95,000	-18.6%	-1,000	-1.3%
All rentals	-11,000	-3.0%	39,000	3.8%	42,000	12.0%
Owner stock	136,000	13.5%	239,000	16.0%	333,000	32.4%
URE/seasonal	18,000	23.6%	16,000	31.4%	14,000	68.9%
Housing stock	143,000	9.9%	295,000	11.4%	389,000	27.9%
Change: 2005-2013						
Affordable rentals	54,000	38.4%	15,000	8.0%	38,000	27.3%
Moderate rentals	3,000	2.6%	9,000	2.0%	26,000	13.5%
High rent rentals	-41,000	-39.9%	99,000	23.9%	23,000	40.8%
All rentals	15,000	4.3%	123,000	11.5%	87,000	22.5%
Owner stock	-3,000	-0.3%	-152,000	-8.8%	-87,000	-6.4%
URE/seasonal	23,000	24.1%	54,000	79.9%	37,000	108.2%
Housing stock	36,000	2.2%	25,000	0.9%	38,000	2.1%

Table 6-11: Forward-Looking and Backward-Looking Analysis (Suburbs)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL only)	
	Number	Percent	Number	Percent	Number	Percent
Were affordable in 2013	56,000	50.9%	39,000	33.1%	40,000	47.1%
To moderate rental	0	0.4%	21,000	18.0%	11,000	13.1%
To high rental	7,000	6.3%	32,000	26.8%	5,000	5.4%
Gentrified	7,000	6.7%	53,000	44.8%	16,000	18.5%
Changed tenure	10,000	8.9%	17,000	14.4%	7,000	7.9%
Became URE/seasonal	10,000	9.0%	2,000	1.8%	2,000	2.6%
Temporary lost to stock	0	0.0%	0	0.0%	2,000	2.7%
Permanent loss	27,000	24.5%	7,000	5.9%	18,000	21.3%
1985 affordable stock	110,000	100.0%	118,000	100.0%	86,000	100.0%
Were added to the stock	46,000	23.6%	44,000	21.7%	31,000	17.3%
Were affordable in 1985	56,000	28.9%	39,000	19.4%	40,000	22.5%
From moderate rental	27,000	14.0%	44,000	21.7%	52,000	29.2%
From high rental	33,000	16.9%	32,000	15.9%	0	0.0%
Filtered	60,000	30.9%	76,000	37.5%	52,000	29.2%
Changed tenure	30,000	15.5%	41,000	20.2%	51,000	28.5%
Were URE/seasonal	2,000	1.1%	2,000	1.2%	4,000	2.5%
Were temporarily lost in 1985	0	0.0%	0	0.0%	0	0.0%
2013 affordable stock	195,000	100.0%	202,000	100.0%	179,000	100.0%

Table 6-12: AFFORDABLE AND ASSISTED (Suburbs)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (IL only)	
	Number	Percent	Number	Percent	Number	Percent
CONTRIBUTION OF ASSISTED HOUSING						
Affordable rental in 1985	110,000		118,000		86,000	
Assisted	47,000	42.4%	25,000	21.2%	13,000	15.4%
Affordable in 2013	195,000		202,000		179,000	
Assisted	49,000	25.2%	31,000	15.6%	14,000	8.0%
HISTORY OF UNITS AFFORDABLE IN BOTH 1985 AND 2013						
Always affordable	47,000	83.2%	25,000	63.8%	13,000	32.8%
Always rental but not always affordable	7,000	12.6%	7,000	18.6%	14,000	33.4%
Sometimes not rental	2,000	4.2%	7,000	17.6%	14,000	33.7%
Affordable in 1985 & 2013	56,000	100.0%	39,000	100.0%	40,000	100.0%
HISTORY OF THE 1985 RENTAL STOCK						
Always affordable	47,000	12.7%	25,000	2.4%	13,000	3.8%
Always moderate	0	0.0%	35,000	3.4%	8,000	2.2%
Always high	0	0.0%	18,000	1.8%	0	0.0%
Filtered down monotonically	9,000	2.5%	23,000	2.3%	11,000	3.3%
Filtered up monotonically	0	0.0%	24,000	2.3%	2,000	0.7%
Always rental	77,000	21.0%	386,000	37.4%	112,000	32.3%
Sometimes not rental	234,000	63.8%	520,000	50.4%	200,000	57.7%
1985 rental stock	367,000	100.0%	1,031,000	100.0%	347,000	100.0%

Table 6-13: Rental Housing by Structure and Size in 2013 (Suburbs)

	New York/Nassau-Suffolk		Greater Los Angeles		Greater Chicago (Illinois only)	
	Number	Percent	Number	Percent	Number	Percent
Moderate and high rentals in 2013						
Mobile homes	0	0.0%	7,000	0.7%	0	0.0%
Single-family, detached	53,000	30.2%	295,000	29.7%	60,000	20.3%
Single-family, attached	8,000	4.7%	91,000	9.2%	29,000	9.9%
2-4 unit structures	46,000	25.8%	163,000	16.4%	44,000	14.8%
5-9 unit structures	26,000	14.8%	151,000	15.2%	61,000	20.4%
10-19 unit structures	25,000	14.2%	120,000	12.0%	34,000	11.4%
20-49 unit structures	14,000	7.6%	80,000	8.0%	36,000	12.2%
50+ unit structures	5,000	2.6%	86,000	8.7%	33,000	11.0%
Total	177,000	100.0%	992,000	100.0%	297,000	100.0%
Affordable rental in 2013						
Mobile homes	0	0.0%	5,000	2.5%	0	0.0%
Single-family, detached	41,000	20.8%	63,000	31.2%	47,000	26.4%
Single-family, attached	9,000	4.5%	5,000	2.7%	7,000	4.1%
2-4 unit structures	66,000	34.1%	40,000	19.9%	34,000	18.7%
5-9 unit structures	11,000	5.6%	24,000	12.0%	45,000	25.0%
10-19 unit structures	12,000	6.1%	20,000	9.9%	13,000	7.0%
20-49 unit structures	11,000	5.8%	24,000	11.9%	20,000	11.2%
50+ unit structures	45,000	23.1%	20,000	10.0%	13,000	7.5%
Total	195,000	100.0%	202,000	100.0%	179,000	100.0%