

COMPONENTS OF INVENTORY CHANGE AND RENTAL DYNAMICS

New Orleans 2004-2009



American Housing Survey

**Components of
Inventory Change
And Rental Dynamics:
New Orleans
2004–2009**

Prepared For:

**U.S. Department of Housing & Urban Development
Office of Policy Development & Research**

Prepared By:

**Frederick J. Eggers & Fouad Moumen
Econometrica, Inc.
Bethesda, Maryland
Kwame Donaldson
U. S. Census Bureau
Suitland, Maryland**

**Contract No. C-CHI-01030
Order No. CHI-T0001
Project No. 1031-000**

July 2011

Table of Contents

<i>List of Figures and Tables</i>	<i>iv</i>
<i>Note to Readers of PDF Version</i>	<i>v</i>
<i>Executive Summary</i>	<i>vi</i>
Overview	1
General Overview of CINCH and Rental Dynamics Analysis	1
Hurricane Katrina and Changes in the New Orleans Housing Stock.....	3
Impact of Hurricane Katrina: An Initial Look	6
Organization of the Report	8
Data Issues Affecting the Analyses	8
How to Read CINCH Tables	9
Columns Common to Both Forward-Looking and Backward-Looking Tables	9
Columns Unique to Forward-Looking Tables	11
Columns Unique to Backward-Looking Tables	12
Table A.....	13
Table B.....	14
Table C	14
Table D	15
Hurricane Katrina and Other Losses to the New Orleans Housing Stock	34
Repairs, New Construction, and Other Additions	39
Rental Market Dynamics	46
Hurricane Katrina and the New Orleans Housing Stock	51
Appendix A: Internal and External Checks	A-1

List of Figures and Tables

Figure 1: The CINCH Objective.....	3
Figure 2: The CINCH Framework for New Orleans.....	4
Table 1: Impact of Hurricane Katrina on the Evolution of the New Orleans Housing Stock.....	7
Forward-Looking Table A: Unit and Structure Characteristics – All Housing Units	16
Forward-Looking Table B: Condition of Unit – All Occupied Units	19
Forward-Looking Table C: Household Characteristics – All Occupied Units	21
Forward-Looking Table D: Tenure, Housing Cost, and Income – All Occupied Units ...	23
Backward-Looking Table A: Unit and Structure Characteristics – All Housing Units.....	25
Backward-Looking Table B: Condition of Unit – All Occupied Units.....	28
Backward-Looking Table C: Household Characteristics – All Occupied Units	30
Backward-Looking Table D: Tenure, Housing Cost, and Income – All Occupied Units.	32
Table 2: Units Lost and Units Severely Damaged or Destroyed by Hurricane Katrina ..	35
Table 3: Units Repaired or Added	41
Table 4: Forward-Looking Rental Dynamics Analysis, Counts: 2004–09.....	48
Table 5: Forward-Looking Rental Dynamics Analysis, Row Percentages: 2004–09	48
Table 6: Affordability of Rental Stocks: 2004 vs. 2009	49
Table 7: Backward-Looking Rental Dynamics Analysis, Counts: 2009–2004	50
Table 8: Backward-Looking Rental Dynamics Analysis, Row Percentages: 2009–2004	50
Table 9: New Orleans: Pre- and Post-Hurricane Katrina – based on published AHS data	52
Table 10: CINCH Analysis of Changes in the New Orleans Housing Stock: 2004–05 ..	53

Note to Readers of PDF Version

Forward-looking and backward-looking Tables A through D on pages 16 through 33 should be printed using legal-sized paper; the remainder of the report can be reproduced on letter-size paper.

Executive Summary

Components of Inventory Change (CINCH) and rental market dynamics are two techniques for explaining how changes that take place in a housing market over time come about in physical (bricks and mortar) terms. CINCH focuses first on the overall number and then the characteristics of units at different times. Using CINCH methods, analysts answer such questions as: “What happened to the x units that disappeared from the housing stock between the beginning and the end of the period?” or “Where did the increase in owner-occupied units come from?”

Rental market dynamics, which is really a type of CINCH analysis, focuses on the rental market with particular emphasis on the affordability of rental housing. Using rental market dynamics techniques, analysts answer such questions as: “Has the number of rental units affordable to households with very low incomes increased or decreased over the period?” or “What happened to the rental units that were affordable to low-income households at the beginning of the period?”

The devastation caused by Hurricane Katrina in August 2005 makes the New Orleans CINCH and rental dynamics report special. Published data from the 2004 and 2009 American Housing Surveys (AHS) of New Orleans provide an excellent overview of how the New Orleans metropolitan area changed from 1 year before Hurricane Katrina to 4 years afterwards.

In 2004, 1,234,900 people lived in the metropolitan area; in 2009, the population was down to 1,078,500. This population decline was accompanied by a loss of 62,200 households and 48,500 housing units. Since the decline in households was greater than the decline in housing units, the vacancy rates in both the rental sector and owner sector increased.

CINCH analysis allows us to look more deeply, albeit imperfectly, into these changes by tracking losses and additions between 2004 and 2009. Using the AHS sample, CINCH estimates that Hurricane Katrina severely damaged or destroyed 40,400 housing units. An additional 37,800 units were lost in other ways between 2004 and 2009. It would be incorrect to label these 37,800 units as losses “unrelated” to Hurricane Katrina. The New Orleans metropolitan housing market had a high rental vacancy rate in 2004, and the subsequent loss of 62,200 households further weakened the market. Losses from other causes were undoubtedly accelerated by the decline in the population of New Orleans resulting from Hurricane Katrina.

Unfortunately, the AHS data on the non-Hurricane Katrina losses suffer from two deficiencies—a puzzling failure to identify any mobile homes that were moved off of their lots and an overwhelming majority of other losses (77.8 percent) classified as due to “other causes.”

The percentage of units lost from all causes was significantly higher for units that were vacant in 2004 than for the overall stock (19.4 percent vs. 12.4 percent), and the loss rate varied significantly by tenure (15.1 percent for renter-occupied units and 9.4 percent for owner-occupied units). Among rental units the loss rates were highest among the lowest-rent units and units with no cash rent and among units renting to the lowest-income households. While the same patterns are seen among units severely damaged or destroyed by Hurricane Katrina, these

loss rates are generally not statistically significantly different from the overall rate of loss from Hurricane Katrina.

Losses from all causes were also particularly high among small units, those with fewer than five rooms or fewer than three bedrooms. The same pattern applies to Hurricane Katrina losses but with fewer instances where the rates are statistically different from the overall rate.

Rebuilding of damaged units contributed little to the 2009 New Orleans housing stock. Only 4,700 of the 40,400 units severely damaged or destroyed by Hurricane Katrina were rebuilt by 2009. Another 34,700 units were added to the New Orleans housing stock between 2004 and 2009. Of these, 18,600 were newly constructed; 13,100 were added by means other than new construction; and 3,000 were units added after the 2004 survey that were subsequently severely damaged or destroyed by Hurricane Katrina and then rebuilt by 2009. At the national level, new construction typically accounts for approximately 70 percent of all additions. However, the national percentage fell to 52 percent in the weak housing market of the 2007 to 2009 period. New construction accounted for 58.7 percent of additions in New Orleans.

Additions other than new construction consisted of 1,300 units added through the merging or splitting of existing units; 1,700 units added by the moving in of mobile homes or houses; 3,200 units added by converting nonresidential structures to residential use; 3,000 units added by recovering units that had serious structural deficiencies or had been condemned in 2004; and 3,900 units added in unspecified ways.

Mobile homes constituted 11.9 percent of the units that were added or rebuilt while comprising only 4.0 percent of the overall stock. The rate of new construction was significantly lower among smaller units—those with four or fewer rooms or two or fewer bedrooms—and among renter-occupied units. Additions by means other than new construction were statistically more common among the smaller units.

Rebuilding was most common in owner-occupied units with housing costs between \$350 and \$799 per month and those occupied by households earning less than \$15,000 annually.

The rental dynamics analysis shows that rental housing was more affordable in 2009 than in 2004. The share of the rental stock affordable to households earning 50 percent or less of area median income was 76.5 percent in 2009 compared to 60.9 percent in 2004. The improvement in rental market affordability between 2004 and 2009 can be traced to two causes, shifts in supply and demand and changes in the income characteristics of the population. Both causes are strongly linked to Hurricane Katrina. While the rental stock declined by 27,500 units, the rental vacancy rate rose sharply, from 14.4 percent in 2004 to 20.1 percent in 2009, due to the decline in the renter population that accompanied the general decline in population after Hurricane Katrina. In addition, the 2009 population was a higher-income population than the 2004 population. A greater percentage of lower-income households than higher-income households appears to have left the metropolitan area after Hurricane Katrina. As a result, median income rose from \$33,036 in 2004 to \$40,000 in 2009.¹ Because the affordability of a rental unit depends upon median income, this increase improves affordability.

¹ This 21.1-percent increase substantially exceeds the 12.3-percent national increase.

Components of Inventory Change and Rental Market Dynamics: New Orleans 2004–2009

Overview

This report focuses on the New Orleans metropolitan housing market over the period between 2004 and 2009. It is one of two reports based on local American Housing Surveys (AHS) conducted in 2004 and 2009; the other report examines the housing stock changes that occurred in the Seattle metropolitan area.²

General Overview of CINCH and Rental Dynamics Analysis

Components of Inventory Change (CINCH) and rental market dynamics are two techniques for explaining how changes that take place in a housing market over time came about in physical (bricks and mortar) terms. CINCH focuses first on the overall number and then the characteristics of units at different times. Using CINCH methods, analysts answer such questions as: “What happened to the x units that disappeared from the housing stock between the beginning and the end of the period?” or “Where did the increase in owner-occupied units come from?”

Rental market dynamics, which is really a type of CINCH analysis, focuses on the rental market with particular emphasis on the affordability of rental housing. Using rental market dynamics techniques, analysts answer such questions as: “Has the number of rental units affordable to households with very low incomes increased or decreased over the period?” or “What happened to the rental units that were affordable to low-income households at the beginning of the period?”³

CINCH and rental market dynamics have both forward-looking and backward-looking components. The forward-looking component starts with the housing stock available at the beginning of the period and then, looking at the end of the period, attempts to explain what happened to those units. Possible answers include: some units still exist and serve the same market, some units still exist but serve a different market, some units have been demolished or destroyed in natural disasters, or some units are being used for nonresidential purposes. The backward-looking component starts with the housing stock available at the end of the period and, looking at the beginning of the period, attempts to explain where those units came from. Possible answers include: some units existed at the beginning of the period and served the same

² HUD and the Census Bureau surveyed an additional five metropolitan areas in 2009: Chicago, Detroit, New York, Northern New Jersey, and Philadelphia. These areas were surveyed using a combination of data from the 2009 national AHS and special supplemental surveys. In 2009, new supplemental samples were drawn in each of these five areas to replace the supplement samples that had been used in 1995, 1999, and 2003. The inability to track the old supplement samples forward from 2003 to 2009 and the inability to track the new supplement samples backwards from 2009 to 2003 made it impossible to perform CINCH and rental dynamics analyses for these five areas for the 2003–09 period.

³ See <http://www.huduser.org/datasets/cinch.html> for examples of previous CINCH and rental dynamics studies.

market, some units existed at the beginning of the period but served a different market, some units were newly constructed over the period, or some units were being used for nonresidential purposes at the beginning of the period. Neither CINCH nor rental market dynamics try to track the experience of a unit over the entire period; both are interested only in the beginning and the end of the period. For example, a housing unit in 2004 may have become a medical office in 2005 but returned to being a housing unit in 2007. CINCH would record this unit as having undergone no change over the period from 2004 to 2009. In research jargon, CINCH and rental market dynamics are *comparative static* analyses.

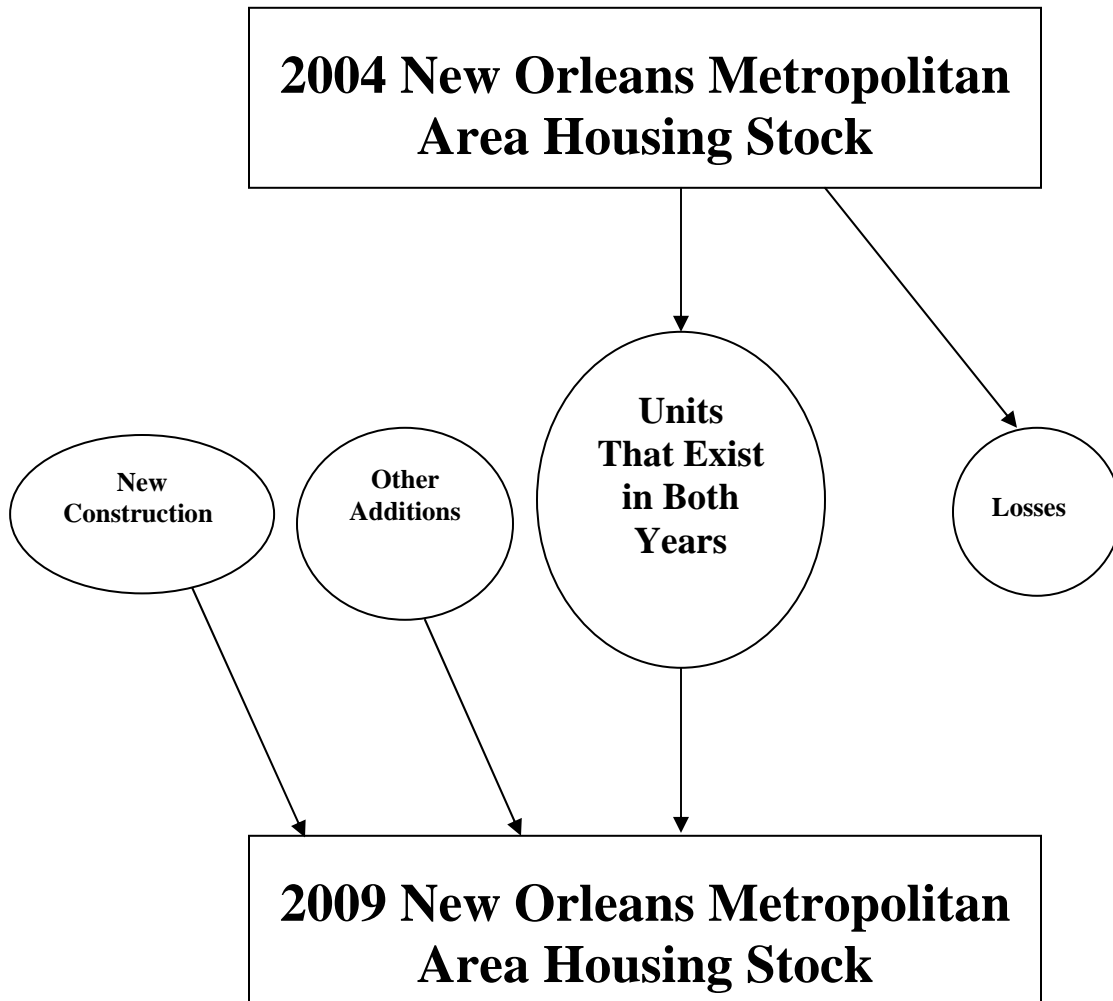
Ideally, one would want to combine the forward-looking and backward-looking analyses to produce a complete accounting that can explain the beginning and the end consistently in terms of units that existed in both periods, losses from the stock over the period, and additions to the stock over the period. The research in this report uses the AHS, which is a sample of units at both points in time, and previous efforts have learned that creating sample weights that take both periods into account can generate some inconsistent or inaccurate results. For this reason, recent CINCH and rental market dynamics studies have separated the forward-looking and backward-looking components. This paper will do the same. The procedures used to create the forward-looking and backward-looking weights are explained in a separate paper.⁴

Figure 1 on the next page illustrates the question that CINCH analysis seeks to answer and how this analysis has been conducted previously on both the national housing stock and the housing stock in selected metropolitan areas. Figure 1 contains four ovals and two rectangles. The Census Bureau provides estimates for both rectangles and one oval (units added through new construction between 2004 and 2009). No one estimates the other three ovals: the number of units that belong to both the 2004 and 2009 housing stock, units lost to the housing stock between 2004 and 2009, and other additions to the housing stock between 2004 and 2009. CINCH analysis provides estimates for all of the ovals and rectangles.

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

⁴ *Weighting Strategy for 2004-2009 New Orleans CINCH Analysis*, URL [to be added in final report].

Figure 1: The CINCH Objective



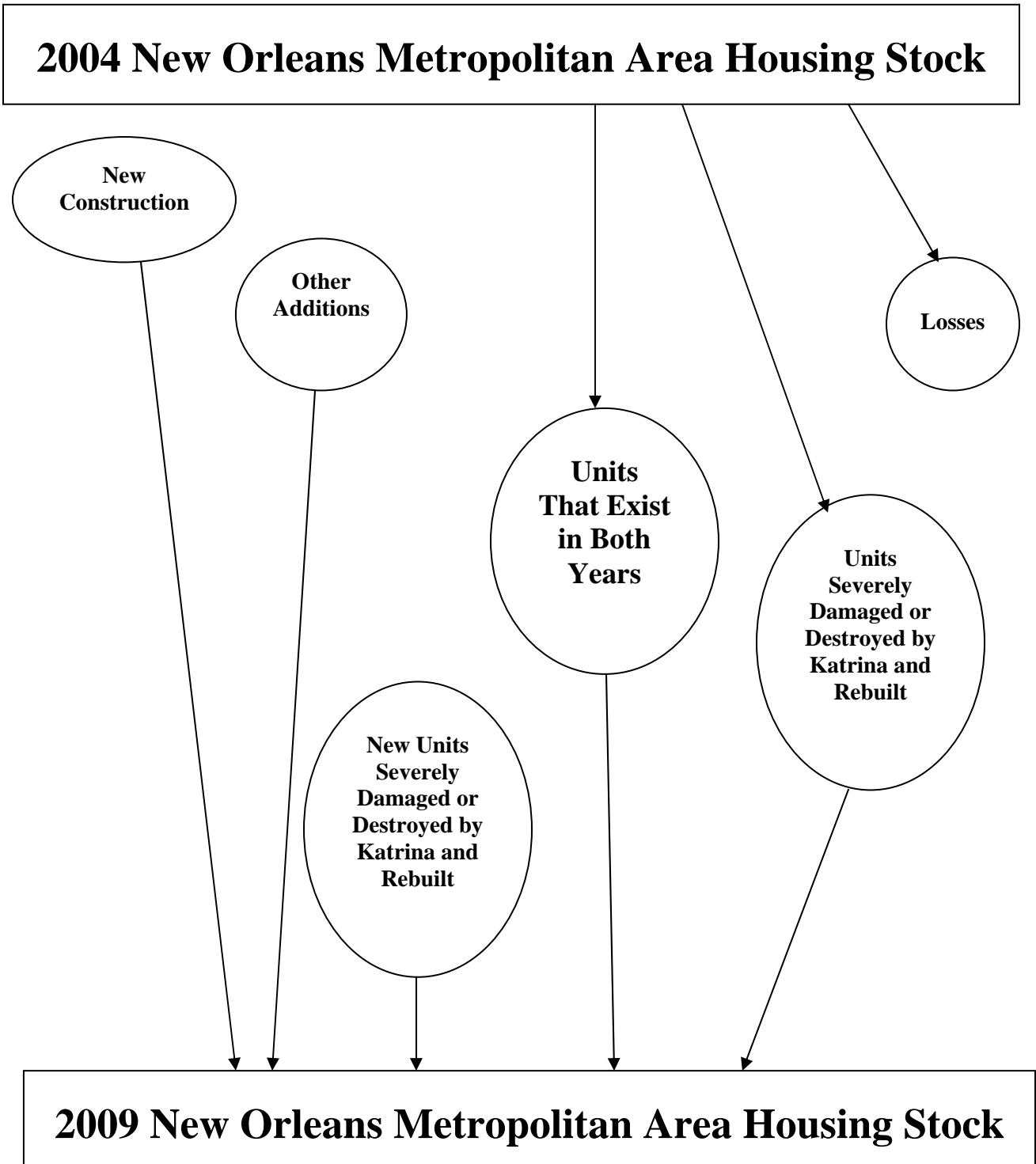
Hurricane Katrina and Changes in the New Orleans Housing Stock

The devastation caused by Hurricane Katrina in August 2005 makes the New Orleans CINCH and rental dynamics report special. In 2004 the New Orleans metropolitan area boasted a housing stock of 561,000 units; with the recovery still underway in 2009, the New Orleans housing stock was 512,500 units—a loss of 48,500 units, 8.6 percent of the 2004 stock.⁵ This report focuses on how Hurricane Katrina affected the housing stock in the New Orleans metropolitan area.

Hurricane Katrina had such a strong impact on New Orleans housing stock that we had to revise the categories that we use to describe how the housing stock evolves. Figure 2 shows how the evolution of the New Orleans housing stock has to be portrayed in light of Hurricane Katrina.

⁵ The population declined so much in the city of New Orleans as a result of Hurricane Katrina that the Census Bureau had to draw a new sample of housing units in the city proper to protect the confidentiality of respondents.

Figure 2: The CINCH Framework for New Orleans



We had to add two new ovals to the CINCH analysis for New Orleans to describe adequately the changes in the housing stock between 2004 and 2009. On the right side of Figure 2, we added an oval to depict units that were part of the 2004 housing stock, that were subsequently made uninhabitable by Hurricane Katrina, and that were rebuilt by 2009. In regular CINCH analysis, the units in this oval would have been included in the Units That Exist in Both Years oval.

On the left side of the Figure 2, we added an oval to identify units added to the New Orleans housing stock after the 2004 AHS but before September 2005 that were severely damaged or destroyed by Hurricane Katrina and rebuilt. In regular CINCH analysis, the units in this oval would have been included in either the new construction or other additions ovals.⁶

Because of the two new ovals, we have modified our characterization of the ways that units change over time.

In normal forward-looking CINCH analysis, the 2009 status of units in the housing stock in 2004 is categorized into the following seven categories:

- In both the 2004 and 2009 housing stocks with the same characteristic in both years.
- In both the 2004 and 2009 housing stocks with a different characteristic in 2009.
- In the 2004 stock but a loss in 2009 due to house or mobile home move out.
- In the 2004 stock but a loss in 2009 due to nonresidential use.
- In the 2004 stock but a loss in 2009 due to demolition or disaster.
- In the 2004 stock but a loss in 2009 due to damage or condemnation.
- In the 2004 stock but a loss in 2009 for other reason.

In the New Orleans case, the forward-looking analysis contains three additional categories and corresponding modifications to the definitions of the other categories:

- In both the 2004 and 2009 housing stocks with the same characteristic in both years, *not severely damaged or destroyed by Hurricane Katrina*.
- In both the 2004 and 2009 housing stocks with a different characteristic in 2009, *not severely damaged or destroyed by Hurricane Katrina*.
- *In the 2004 stock, severely damaged or destroyed by Hurricane Katrina, and rebuilt with the same characteristic in both years.*
- *In the 2004 stock, severely damaged or destroyed by Hurricane Katrina, and rebuilt with a different characteristic in 2009.*
- In the 2004 stock but a loss in 2009 due to house or mobile home move out.
- In the 2004 stock but a loss in 2009 due to nonresidential use.
- In the 2004 stock but a loss in 2009 due to demolition or disaster, resulting from causes other than Hurricane Katrina.

⁶ Identification of the units in these two new ovals was made possible by a set of AHS questions developed by HUD and the Census Bureau specifically to study the effects of Katrina and subsequent recovery efforts. See the chapter on these New Orleans variables beginning on page 1,016 in *Codebook for the American Housing Survey, Public Use File: 1997 and later*, April 2011, Version 2.0.

- In the 2004 stock but a loss in 2009 due to damage or condemnation, resulting from causes other than Hurricane Katrina.
- *In the 2004 stock but a loss in 2009 due to being severely damaged or destroyed by Hurricane Katrina.*
- In the 2004 stock but a loss in 2009 for other reason.

In normal backward-looking CINCH analysis, the origin of units in the 2009 stock is categorized in the following eight categories:

- In both the 2009 and 2004 housing stocks with the same characteristic in both years.
- In both the 2009 and 2004 housing stocks with a different characteristic in 2004.
- In the 2009 stock but not in the 2004 stock; added by conversion or merger.
- In the 2009 stock but not in the 2004 stock; added by house or mobile home move in.
- In the 2009 stock but not in the 2004 stock; added from nonresidential use.
- In the 2009 stock but not in the 2004 stock; added by new construction.
- In the 2009 stock but not in the 2004 stock; added from temporary losses in 2004 stock.
- In the 2009 stock but not in the 2004 stock; added by other means.

In the New Orleans case, the backward-looking analysis contains three additional categories and modifications to the definitions of the other categories:

- In both the 2009 and 2004 housing stocks with the same characteristic in both years, *not severely damaged or destroyed by Hurricane Katrina.*
- In both the 2009 and 2004 housing stocks with a different characteristic in 2004, *not severely damaged or destroyed by Hurricane Katrina.*
- *In the 2004 stock, severely damaged or destroyed by Hurricane Katrina, and rebuilt with the same characteristic in both years.*
- *In the 2004 stock, severely damaged or destroyed by Hurricane Katrina, and rebuilt with a different characteristic in 2009.*
- In the 2009 stock but not in the 2004 stock; added by conversion or merger.
- In the 2009 stock but not in the 2004 stock; added by house or mobile home move in.
- In the 2009 stock but not in the 2004 stock; added from nonresidential use.
- In the 2009 stock but not in the 2004 stock; added by new construction.
- In the 2009 stock but not in the 2004 stock; added from temporary losses in the 2004 stock.
- *In the 2009 stock but not in the 2004 stock; added before Hurricane Katrina, severely damaged or destroyed by Hurricane Katrina, and rebuilt.*
- In the 2009 stock but not in the 2004 stock; added by other means.

Impact of Hurricane Katrina: An Initial Look

Table 1 provides a global picture of how Hurricane Katrina affected the New Orleans housing stock. The forward-looking analysis shows that New Orleans lost 12.4 percent of its housing stock between 2004 and 2009; slightly less than half of that lost was directly due to Hurricane Katrina. Some of the losses classified as unrelated to damage from Hurricane Katrina may have

occurred because of the substantial outmigration that occurred after Hurricane Katrina. Of the 491,700 units that survived to 2009, only 8,800 were units that had been severely damaged or destroyed by Hurricane Katrina and rebuilt by 2009.

Table 1: Impact of Hurricane Katrina on the Evolution of the New Orleans Housing Stock

FORWARD-LOOKING ANALYSIS		
2004 Housing Stock	561,000	
2004 stock lost by 2009	69,400	12.4%
Stock lost because of Hurricane Katrina	31,600	5.6%
Stock lost for other reasons	37,800	6.7%
2004 stock that survived to 2009	491,700	87.6%
2004 stock that survived without major repairs	482,900	86.1%
2004 stock that was severely damaged or destroyed and rebuilt	8,800	1.6%
BACKWARD-LOOKING ANALYSIS		
2009 Housing Stock	512,500	
2004 stock that survived to 2009	477,800	93.2%
2004 stock that survived without major repairs	473,100	92.3%
2004 stock that was severely damaged or destroyed and rebuilt	4,700	0.9%
Additions severely damaged or destroyed by Hurricane Katrina and rebuilt	3,000	0.6%
New construction, not affected by Hurricane Katrina	18,600	3.6%
Other additions, not affected by Hurricane Katrina	13,100	2.6%

The backward-looking analysis shows that 92 percent of the 2009 housing stock were units that survived from the 2004 stock without suffering major damage from Hurricane Katrina. The remaining 8 percent of the 2009 stock consisted mostly of newly constructed units not affected by Hurricane Katrina (3.6 percent) or other additions not affected by Hurricane Katrina (2.6 percent). Rebuilding after Hurricane Katrina contributed only 1.5 percent of the 2009 stock. Rebuilding of units from the 2004 stock contributed only 4,700 units, and rebuilding of units that entered the stock after the 2004 AHS but before Hurricane Katrina contributed only 3,000 units.

The reader will notice that Table 1 presents different estimates for the 2004 stock that survived to 2009, the 2004 stock that survived with major repairs, and the 2004 stock that was severely damaged or destroyed and rebuilt. The different estimates result from the different weights used in the forward-looking and backward-looking analyses.

In the concluding section, we will present a fuller discussion of what happened to the New Orleans housing stock over this period.

Organization of the Report

The remainder of this report consists of six sections:

- A discussion of data issues affecting the analyses.
- An explanation of how to read the CINCH tables.
- Two sets of four tables each: a set of forward-looking tables tracing the movement of units from 2004 to 2009 and identifying how units were lost to the housing stock, and a set of backward-looking tables tracing where 2009 units came from and distinguishing between units that were part of the stock in 2004 and units that were additions to the stock since 2004. These tables use the modified categories described in the section entitled Hurricane Katrina and Changes in the New Orleans Housing Stock.
- Two tables, and accompanying discussion, that highlight interesting changes in the New Orleans housing stock between 2004 and 2009.
- A discussion of the rental market dynamics results, using CINCH-like tables.
- A discussion of what happened to the New Orleans housing stock over this period.

Appendix A explains how the results were tested.

Data Issues Affecting the Analyses

The AHS underwent three changes between 2004 and 2009 that complicate the CINCH and rental dynamics analyses in this paper:

- In 2009, the U.S. Department of Housing and Urban Development (HUD) reduced the sample sizes of both the national AHS and metropolitan AHS because of its reduced research budget. This reduction had no impact on the AHS for New Orleans, probably because of the importance of the issues related to Hurricane Katrina. In 2004, the AHS sample for New Orleans contained 4,516 housing units; the 2009 sample contained 4,821 housing units.
- In 2005, the Census Bureau replaced approximately half of the manufactured housing units (mobile homes) in the AHS samples—both national and metropolitan—with newly sampled units to improve the coverage of mobile homes constructed before 2000.
- In 2009, the Census Bureau had to draw a new sample of housing units in the city proper to protect the confidentiality of respondents. The Census Bureau also interviewed the units in New Orleans city that were in the 2004 sample but did not release these data to the public.

All three changes potentially reduce the number of sample cases that can be tracked from 2004 to 2009. To get around the effect of the new central city sample, this report uses the data from the original city of New Orleans sample, and all the analysis was conducted at the Census Bureau by Kwame Brown, a Census Bureau analyst.

The metropolitan samples are much smaller than the national sample, and therefore the incidence of categories (cells) that contain small samples is higher with the metropolitan sample. The sample weights typically range between 150 and 200 housing units per sample unit, so a reported result of 600 housing units would be based on 3 or 4 sample units.⁷

How to Read CINCH Tables

Rows and columns serve different purposes in CINCH tables. The rows identify classes of units to be analyzed. The columns trace those units either forward or backward.

The forward-looking tables are concerned with what happened to the 2004 housing stock by 2009. There are three basic dispositions of 2004 units: (1) units that continue to exist in 2009 with the same characteristics (or serving the same market), (2) units that continue to exist in 2009 but with different characteristics (or serving a different market), or (3) units that were lost to the stock.

The backward-looking tables are concerned with where the 2009 housing stock came from in reference to 2004. There are three basic sources of 2009 units: (1) units that existed in 2004 with the same characteristics (or serving the same market), (2) units that existed in 2004 but with different characteristics (or serving a different market), or (3) units that are additions to the housing stock.

The essence of the CINCH analysis lies in the columns because they specify the state of a unit in the other time period.

Columns Common to Both Forward-Looking and Backward-Looking Tables

- The first column contains the row numbers—the row numbers are identical for the same tables in the forward-looking and backward-looking sets.

Columns A through G set up the analysis and track units that exist in both periods.

- Column A specifies the characteristic that defines the subset of the stock that is being tracked forward or backward in a particular row. For example, row 2 of Forward-Looking Table A focuses on occupied units; row 15 focuses on units built in 1995 through 1999.

⁷ The weights for mobile homes in the forward-looking analysis are much higher, typically around 1,200.

- Column B gives the estimate published in the AHS report for the number of units that satisfy the conditions specified in column A. For example, the 2004 AHS report for New Orleans counted 498,200 occupied units (row 2, column B, Forward-Looking Table A); the 2009 AHS report counted 436,000 occupied units (row 2, column B, Backward-Looking Table A).
- Column C gives the CINCH estimate of the number of units that satisfy two conditions: (a) being part of the housing stock in the relevant year (2004 for the forward-looking tables and 2009 for the backward-looking tables), and (b) satisfying the condition in column A. CINCH uses different weights than those used in preparing the published AHS reports. Therefore, CINCH estimates can differ from AHS estimates for particular subsets of the housing stock. The weights were created to match (except for rounding) AHS-published totals for rows 2 through 4 of Table A and rows 2 and 4 of Table D. This perfect match will not be true of other rows.⁸
- Column D is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, (b) were *not* severely damaged or destroyed by Hurricane Katrina, and (c) continue to belong to the subset defined by column A. For example, column D of row 2 of Forward-Looking Table A estimates that 377,200 of the occupied units from 2004 were also occupied in 2009.
- Column E is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, (b) were *not* severely damaged or destroyed by Hurricane Katrina, but (c) no longer belong to the subset defined by column A. Column E of row 2 of Forward-Looking Table A indicates that 56,100 units that were occupied in 2004 are still part of the housing stock in 2009 but are no longer occupied. In some cases, the analysis will not allow a unit to change characteristics between the base year and the other year. Examples include type of structure, year built, and number of stories; these are characteristics that are considered impossible or unlikely to change.
- Column F is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, (b) were severely damaged or destroyed by Hurricane Katrina but were *rebuilt*, and (c) continue to belong to the subset defined by column A. For example, column F of row 2 of Forward-Looking Table A estimates that 6,300 of the occupied units from 2004 were rebuilt and also occupied in 2009.
- Column G is the CINCH estimate of the number of units from column C that (a) are also part of the housing stock in the *other* year, (b) were severely damaged or destroyed by Hurricane Katrina but were *rebuilt*, but (c) no longer belong to the subset defined by column A. Column G of row 2 indicates that 1,700 units that were occupied in 2004 are

⁸ Columns B and C will also match, except for rounding, in row 1 of Table A because row 1 is defined as the sum of rows 2 through 4. Categories for which the CINCH weights seem to have trouble matching the published numbers were in the forward-looking analysis (the number of mobile homes, households on welfare, rental units that do not have a cash rent, and all categories of owner-occupied units by monthly housing costs) and in the backward-looking analysis (the number of mobile homes, units built in 2005 or later, units built 1920–29, and rental units that do not have a cash rent).

still part of the housing stock in 2009 but are no longer occupied. As with column E, the analysis will not allow a unit to change characteristics between the base year and the other year.

Columns Unique to Forward-Looking Tables

In forward-looking tables, columns H through N track what happened to units that were lost from 2004 to 2009.

- Column H is the CINCH estimate of the number of units from column C that are not in the 2009 housing stock because they were merged with other units or converted into multiple units. In the New Orleans metropolitan area, 2,200 units were lost to mergers or conversions between 2004 and 2009.
- Column I is the CINCH estimate of the number of mobile homes or houses from column C that were moved out during the period. In the New Orleans metropolitan area, no houses or mobile homes were moved out between 2004 and 2009.⁹ We kept column I in the tables to maintain consistency with other CINCH reports.
- Column J is the CINCH estimate of the number of units from column C that became nonresidential at the end of the period. For example, a real estate firm, a tax preparation office, a palm reader, or some other business might buy or rent a house to use for business rather than residential purposes.¹⁰ Among all 2004 housing units, 2,200 became nonresidential by 2009.
- Column K is the CINCH estimate of the number of units from column C that were demolished or were destroyed by fires or natural disasters by 2009. This column does *not* include permanent losses due to Hurricane Katrina. In this case, 2,400 units were demolished or destroyed from the total housing stock by causes other than Hurricane Katrina.
- Column L is the CINCH estimate of the number of units from column C that by 2009 were condemned or that were no longer usable for housing because of extensive damage. This column does *not* include losses of this nature due to Hurricane Katrina. In the New Orleans metropolitan area, 1,600 units are recorded as having been temporarily lost because of damage or similar cause.
- Column M is the CINCH estimate of the number of units from column C that were not in the 2009 housing stock because they had been severely damaged or destroyed by Hurricane Katrina and had not been rebuilt.¹¹ This category includes both permanent

⁹ We had not found an explanation for this puzzling result.

¹⁰ If the owner or tenant both lives in a unit and conducts business out of the unit, the AHS considers the unit to be residential, so nonresidential means strictly no residential use.

¹¹ The standard practice throughout the 38-year history of the AHS has been to stop following a unit after it has been destroyed or demolished. A new unit built on the same land would appear in subsequent AHS surveys only if the unit was drawn as part of the sample of newly constructed units, and if the new unit were so drawn, it would receive

losses (units destroyed) and temporary—or potentially reversible losses—losses (units severely damaged). Among all 2004 housing units, 31,600 were not in the 2009 housing stock because they were severely damaged or destroyed by Katrina and had not been rebuilt.

- Column N is the CINCH estimate of units lost for unspecified other reasons; these losses could be permanent or temporary. From the 2004 housing stock, 29,400 units had been lost by 2009 for other reasons.

The columns form a closed system. Column C counts the number of units tracked forward from 2004; columns D through N account for all the possible outcomes. Therefore, column C minus the sum of columns D through N always equals zero, except for rounding.¹²

Columns Unique to Backward-Looking Tables

In backward-looking tables, Columns H through N track where units came from that are part of the housing stock in 2009 but were not part of the 2004 housing stock.

- Column H is the CINCH estimate of the number of units created through mergers and conversions (splitting one unit into multiple units). Of the entire housing stock in the New Orleans metropolitan area in 2009, 1,300 units were created through mergers or splits.
- Column I is the CINCH estimate of the number of mobile homes included in the count in column C that were moved in during the period. Of the housing units in the 2009 housing stock, 1,700 were mobile homes moved in after 2004.
- Column J is the CINCH estimate of the number of units from column C that had been nonresidential in 2004. Among all 2009 units, 3,200 had been nonresidential.
- Column K is the CINCH estimate of the number of units from column C that were newly constructed between 2004 and 2009. New construction after 2004 accounted for 18,600 units in the 2009 stock.
- Column L is the CINCH estimate of the number of units from column C that were added by 2009 due to the recovery of units that had been temporarily lost to the housing stock because occupancy was prohibited in 2004, or the interior of the unit was exposed to the elements, or for reasons “not classified.” The 2009 housing stock contained 3,000 recovered units.

a new CONTROL number and would be considered a different unit. Because of the special circumstances created by Hurricane Katrina, the Census Bureau changes this practice for New Orleans. Units rebuilt after Hurricane Katrina are retained in the sample with the same CONTROL numbers and are treated as continuations of previous units.

¹² The weighted numbers are rounded to the nearest 100 to match practices used by the Census Bureau in the AHS publications.

- Column M is the CINCH estimate of the number of units that were added to the stock—through either new construction or other means—after the 2004 AHS and before September 2005 that were severely damaged or destroyed by Hurricane Katrina and subsequently rebuilt. We estimate 3,000 units fall into this category.
- Column N includes units added by the Census Bureau by other means. Of the entire housing stock in the New Orleans metropolitan area, 3,900 were added by other means.

The columns form a closed system. Column C counts the number of units tracked backward from 2009; columns D through N account for all the possible sources. Therefore, column C minus the sum of columns D through N always equals zero, except for rounding.

Table A

Table A focuses on the general housing characteristics of the stock. Row 1 provides the highest level CINCH overview of the stock. For this row, column A specifies no conditions other than being part of the stock in the relevant year.

Rows 2–4 divide the housing stock by occupancy status. By Census Bureau definition, the number of occupied nonseasonal units equals the number of households. Because households are the basis for all the analyses in Tables B through D, it is important to get a good starting point for these estimates. For this reason, the weights are designed to match published AHS totals for occupied units (by owner-occupied and renter-occupied), vacant units, and seasonal units.

Rows 5–12 divide the housing stock by type of structure to see what type of units account for losses. Columns E and G are forced to be zero on the grounds that changes in structure types are extremely rare and that any observed changes are most likely data errors.

Rows 13–26 divide the housing stock by year built.¹³ Columns E and G are forced to be zero because units cannot change year built. The reader will note that in Backward-Looking Table A there is an apparent anomaly, namely units reported as newly constructed (Column K) that have year built dates that are inconsistent with being newly constructed. Backward-Looking Table A calls a unit newly constructed if the unit was added to the sample in 2009 from a listing of new construction permits. The Table bases “year built” on information provided by the surveyed household. Most of the inconsistency occurs for units built between 2000 and 2004; therefore, we suspect that most of these cases result from confusion on the part of respondents as to when the unit was constructed.¹⁴

¹³ Row 13 is not included in Forward-Looking Table A because the 2004 housing stock cannot contain units built after 2004.

¹⁴ On the national level, the inconsistency involves earlier years, and in many cases, the apparent anomaly is not really an anomaly. If an existing housing unit is remodeled to the extent that the local jurisdiction requires the contractor to draw a “new construction” permit, then the unit becomes eligible for inclusion in the AHS as a “newly constructed” unit. In these cases, when the Census Bureau questions the household about the age of the unit, the respondent may very well give the date of construction of the original unit and not the date of the remodeling. In

Rows 27–36 and 37–41 divide the housing stock by two different measures of interior space, the number of rooms and the number of bedrooms.

Rows 42–47 focus on multiunit structures only and divide them by number of stories. Columns E and G are forced to be zero.

Table B

This table looks at issues related to the physical quality of units. Row 1 repeats the analysis from row 2 in Table A. All the subsequent rows are based on row 1.

Rows 2–3 look at whether the units have complete kitchens, that is, an installed sink with piped water, a mechanical refrigerator, and built-in burners for the exclusive use of the occupants. Rows 4–5 look at whether the units have complete plumbing facilities, that is, hot-and-cold piped water, a flush toilet, and a bathtub or shower inside the structure for the exclusive use of the occupants.

Rows 6–11 look at how units obtain water and dispose of sewage.

Rows 12–16 look at units with severe physical problems. Rows 13–16 identify specific types of serious deficiencies. Row 12 counts the units having one or more of these deficiencies.¹⁵ Rows 17–21 look at units with moderate problems. Rows 18–21 identify specific types of deficiencies. Row 17 counts the units having one or more of these deficiencies.¹⁶ These rows are in the analysis to answer two questions: (1) whether poor-quality units in one year are also poor-quality units in the other year; and (2) whether poorer-quality units are more likely to be lost.

Table C

This table studies the characteristics of occupants. Row 1 repeats the analysis from row 2 in Table A. All the subsequent rows are based on row 1. In all cases, the analysis seeks to find out how stable occupancy characteristics are over time and what part of the market was served by units that were lost or added between 2004 and 2009.

Rows 2–4 look at the age of the householder. Rows 5–6 look at whether or not the household includes children. Rows 7–17 look at the race or ethnicity of the householder. Rows 18–21 look at four possible sources of household income.

recent years, there have been a substantial number of existing units that have been gutted and totally remodeled, often with a substantial increase in the area of the ground floor, the so-called unit “footprint.”

¹⁵ Row 15 (severe electrical problems) is omitted from the backward-looking tables because the 2009 AHS publications report no housing units with this characteristic in New Orleans.

¹⁶ For definitions of severe and moderate problems, see pages 1,084 and 1,085 of the AHS Codebook, version 2.0, at http://www.huduser.org/intercept.asp?loc=/Datasets/ahs/AHS_Codebook.pdf.

Table D

Table D studies tenure, income, and housing costs. Row 1 repeats the analysis from row 2 in Table A. All the subsequent rows are based on row 1.

Rows 2–4 focus on tenure to see the extent to which units change tenure characteristics and whether rental or owner-occupied units are more likely to be lost or added.

Rows 5–10 analyze the rental stock using 6 categories based on monthly housing costs. Row 5 identifies units provided to tenants for no cash rents, e.g., units provided to maintenance or management personnel or units provided to relatives. Rows 16–20 identify owner-occupied units by total monthly housing costs.

Rows 11–15 track rental units by household income; rows 21–25 track owner-occupied units by household income.¹⁷

¹⁷ The published reports list more categories for both monthly housing costs and household income. This report combined categories for two reasons. First, the sample size in each metropolitan area is small, and therefore larger categories provide more stable measurement of the various types of losses and additions. Second, columns D and E track whether the units in each category remain occupied and stay in the same cost or income category. The combined categories create more interesting analysis because bigger changes in monthly housing costs or income are needed to move between broader categories.

Forward-Looking Table A: Unit and Structure Characteristics – All Housing Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
1	Total Housing Stock	561,000	561,100	482,900	0	8,800	0	2,200	0	2,200	2,400	1,600	31,600	29,400
	Occupancy Status													
2	Occupied	498,200	498,200	377,200	56,100	6,300	1,700	1,500	0	1,200	2,000	1,300	26,400	24,700
3	Vacant	58,900	58,900	14,300	32,400	800	0	600	0	900	300	300	5,000	4,400
4	Seasonal	4,000	4,000	900	2,000	0	0	100	0	200	100	0	300	300
	Units in Structure													
5	1, detached	349,100	346,200	298,800	0	6,100	0	1,300	0	800	1,400	600	19,700	17,500
6	1, attached	49,300	49,200	40,500	0	300	0	0	0	0	300	500	3,800	3,900
7	2 to 4	68,100	68,800	59,600	0	600	0	100	0	600	0	300	2,900	4,600
8	5 to 9	21,300	19,600	15,300	0	600	0	100	0	300	300	200	1,800	1,000
9	10 to 19	16,800	15,600	13,000	0	0	0	300	0	0	200	0	1,100	1,000
10	20 to 49	13,400	13,100	11,200	0	0	0	0	0	200	200	0	800	800
11	50 or more	15,300	15,300	12,300	0	0	0	300	0	300	0	0	1,600	600
12	Mobile Home/trailer	27,800	33,400	32,100	0	1,200	0	0	0	0	0	0	0	0
	Year Built													
14	2000–04	19,900	19,300	18,800	0	0	0	0	0	200	0	0	0	300
15	1995–99	16,700	16,500	14,700	0	300	0	200	0	200	0	0	700	500
16	1990–94	19,100	19,000	17,300	0	300	0	0	0	0	0	0	800	600
17	1985–89	33,800	33,300	30,900	0	300	0	0	0	0	200	200	1,000	800

Forward-Looking Table A (continued): Unit and Structure Characteristics – All Housing Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
18	1980–84	42,100	44,100	38,700	0	1,500	0	0	0	200	300	0	1,900	1,500
19	1975–79	69,400	66,600	61,100	0	500	0	200	0	0	300	0	2,200	2,200
20	1970–74	77,500	79,500	69,500	0	1,100	0	100	0	200	300	0	4,100	4,100
21	1960–69	99,500	100,300	87,600	0	900	0	300	0	0	300	500	7,300	3,400
22	1950–59	60,400	61,100	50,200	0	600	0	0	0	0	500	0	6,600	3,200
23	1940–49	47,300	47,200	33,300	0	1,700	0	300	0	500	0	500	4,500	6,400
24	1930–39	26,000	26,600	20,500	0	800	0	300	0	200	200	300	1,500	2,800
25	1920–29	16,400	16,200	13,700	0	0	0	200	0	300	200	200	500	1,300
26	1919 or earlier	33,100	31,400	26,300	0	800	0	600	0	600	100	0	600	2,300
	Rooms													
27	1 room	1,100	1,000	0	500	0	0	100	0	300	0	0	0	0
28	2 rooms	5,800	5,800	1,900	2,800	0	0	100	0	200	0	0	600	100
29	3 rooms	49,400	49,400	24,500	15,800	0	300	100	0	900	500	100	3,900	3,200
30	4 rooms	113,300	111,300	52,200	37,800	1,100	1,400	600	0	100	600	700	8,300	8,300
31	5 rooms	136,200	139,200	61,500	59,000	1,500	300	300	0	200	700	600	8,500	6,600
32	6 rooms	119,200	118,400	45,900	57,000	800	1,400	500	0	200	300	200	6,000	6,000
33	7 rooms	74,200	75,000	29,500	39,400	300	300	300	0	200	200	0	2,200	2,700
34	8 rooms	33,100	33,100	10,200	20,200	300	0	0	0	0	200	0	800	1,600
35	9 rooms	15,000	14,600	4,200	9,200	0	500	0	0	100	0	0	500	0
36	10 rooms or more	13,800	13,400	2,800	8,400	300	300	0	0	0	0	0	800	800

Forward-Looking Table A (continued): Unit and Structure Characteristics – All Housing Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
	Bedrooms													
37	None	3,700	4,400	600	2,500	0	0	300	0	300	0	0	600	0
38	1	65,000	63,700	40,000	13,700	0	300	100	0	1,100	500	100	4,200	3,700
39	2	154,800	151,400	89,300	33,800	1,700	1,100	600	0	300	1,400	1,000	11,400	10,700
40	3	237,600	243,200	175,200	39,200	2,900	1,100	700	0	300	300	500	11,700	11,400
41	4 or more	100,000	98,400	68,000	20,600	1,100	600	500	0	100	200	0	3,700	3,600
42	Multiunit Structures	134,900	132,400	111,500	0	1,200	0	900	0	1,400	700	500	8,200	8,000
	Stories in Structure													
43	1	NA	31,200	26,700	0	300	0	100	0	100	0	300	1,600	2,100
44	2	NA	71,900	59,800	0	900	0	500	0	1,100	500	0	4,500	4,700
45	3	NA	19,500	16,600	0	0	0	100	0	0	200	200	1,500	1,000
46	4 to 6	NA	5,000	4,500	0	0	0	0	0	200	0	0	300	0
47	7 or more	NA	4,700	3,900	0	0	0	100	0	0	0	0	300	300

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

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
1	Occupied Units	498,200	498,200	377,200	56,100	6,300	1,700	1,500	0	1,200	2,000	1,300	26,400	24,700
	Kitchen													
2	With complete kitchen	492,100	491,700	367,900	60,000	6,300	1,700	1,500	0	800	2,000	1,300	25,900	24,300
3	Lacking complete kitchen facilities	6,100	6,500	0	5,300	0	0	0	0	300	0	0	500	300
	Plumbing													
4	With all plumbing facilities	491,400	490,700	366,900	60,100	6,300	1,700	1,500	0	800	1,600	1,200	26,000	24,700
5	Lack some plumbing	6,800	7,500	200	6,200	0	0	0	0	300	300	200	300	0
	Water													
6	Public/private water	476,200	469,500	352,300	53,400	6,000	1,700	1,500	0	1,200	1,600	1,300	26,000	24,300
7	Well	21,600	28,400	24,100	3,200	300	0	0	0	0	300	0	300	200
8	Other water source	400	300	0	200	0	0	0	0	0	0	0	0	200
	Sewer													
9	Public sewer	462,900	460,500	342,300	55,500	5,800	2,000	1,500	0	800	1,500	1,300	25,900	23,800
10	Septic tank/cesspool	35,100	37,600	29,800	5,500	300	0	0	0	300	300	0	500	800
11	Other	200	200	0	0	0	0	0	0	0	200	0	0	0

Forward-Looking Table B (continued): Condition of Unit – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: in 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
12	Severe Problems	11,900	12,100	200	10,000	0	0	0	0	300	300	200	1,000	200
13	Plumbing	6,800	7,500	200	6,200	0	0	0	0	300	300	200	300	0
14	Heating	4,000	3,500	0	3,100	0	0	0	0	0	0	0	300	200
15	Electric	300	300	0	200	0	0	0	0	0	200	0	0	0
16	Upkeep	1,600	1,500	0	1,100	0	0	0	0	0	0	0	300	0
17	Moderate problems	33,500	33,400	6,600	17,600	300	1,100	200	0	200	0	200	3,600	3,800
18	Plumbing	1,900	2,500	200	1,500	0	300	0	0	0	0	0	300	200
19	Heating	16,500	17,800	6,800	5,200	300	300	200	0	200	0	200	2,000	2,800
20	Kitchen	5,500	6,500	0	5,300	0	0	0	0	300	0	0	500	300
21	Upkeep	10,600	11,200	400	8,100	0	600	0	0	0	0	0	1,500	700

Forward-Looking Table C: Household Characteristics – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
1	Occupied units	498,200	498,200	377,200	56,100	6,300	1,700	1,500	0	1,200	2,000	1,300	26,400	24,700
	Age													
2	Under 65	396,700	394,100	267,900	76,200	2,800	2,300	1,300	0	1,200	1,500	1,300	21,400	18,200
3	65 to 74	50,800	54,800	16,500	29,100	1,800	900	0	0	0	200	0	3,100	3,400
4	75 or older	48,700	49,300	22,700	20,900	0	300	200	0	0	300	0	1,900	3,000
	Children													
5	Some	171,100	173,900	75,200	78,000	1,400	900	1,100	0	0	500	300	6,800	9,800
6	None	327,100	324,300	200,100	80,000	4,100	1,700	300	0	1,200	1,500	1,000	19,600	14,900
	Race/Origin													
7	White	311,900	309,700	0	281,100	0	4,400	200	0	800	1,000	300	14,300	7,600
8	Hispanic	25,500	24,700	0	22,500	0	600	0	0	200	200	200	1,100	0
9	Non-Hispanic	286,400	285,000	0	258,700	0	3,800	200	0	700	800	200	13,200	7,600
10	Black	172,700	176,700	0	141,300	0	3,400	1,300	0	300	1,000	1,000	11,400	16,900
11	Hispanic	3,000	3,100	0	2,600	0	0	0	0	0	0	0	200	300
12	Non-Hispanic	169,600	173,500	0	138,700	0	3,400	1,300	0	300	1,000	1,000	11,300	16,600
13	American Indian, Eskimo, Aleut	1,500	1,300	0	1,000	0	300	0	0	0	0	0	0	0
14	Asian	7,800	7,100	0	6,400	0	0	0	0	0	0	0	500	200
15	Pacific Islander	500	400	0	400	0	0	0	0	0	0	0	0	0
16	Two or more races	3,800	3,100	0	3,000	0	0	0	0	0	0	0	200	0
17	Total Hispanics	29,700	29,300	17,200	9,400	600	0	0	0	200	200	200	1,300	300

Forward-Looking Table C (continued): Household Characteristics – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
	Income Source													
18	Wages and salaries	384,200	379,600	230,200	103,000	2,800	2,800	1,000	0	800	1,100	1,000	18,200	18,500
19	Social Security or pension	136,700	143,600	59,000	61,900	2,900	1,700	700	0	0	500	0	8,900	8,000
20	Dividend or interest	NA	121,300	41,000	67,300	300	800	300	0	500	0	200	6,700	4,200
21	Welfare	34,700	10,300	400	7,100	0	300	300	0	200	200	0	1,200	700

Forward-Looking Table D: Tenure, Housing Cost, and Income – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
1	Occupied units	498,200	498,200	377,200	56,100	6,300	1,700	1,500	0	1,200	2,000	1,300	26,400	24,700
	Tenure													
2	Owner-occupied	323,300	323,300	237,700	48,800	5,400	800	600	0	600	600	200	15,100	13,400
3	Homeownership rate	64.9%	64.9%											
4	Renter-occupied	174,900	174,900	94,900	51,800	0	1,700	800	0	500	1,300	1,200	11,300	11,300
	Renter Monthly Housing Costs													
5	Less than \$350	18,900	20,700	3,600	12,500	0	300	200	0	400	700	0	2,500	700
6	\$350 to \$599	60,900	62,500	8,300	41,800	0	600	300	0	200	0	500	4,800	6,000
7	\$600 to \$799	48,400	49,300	4,600	39,800	0	300	0	0	0	300	200	2,200	2,000
8	\$800 to \$1,249	25,500	24,700	6,700	14,600	0	600	200	0	0	200	500	300	1,700
9	\$1,250 or more	6,900	7,000	2,100	4,400	0	0	200	0	0	0	0	0	300
10	No cash rent	14,400	10,800	1,000	7,500	0	0	0	0	0	200	0	1,500	700
	Renter Hsld Income													
11	Less than \$15,000	58,000	59,700	16,000	32,000	0	600	500	0	400	500	700	5,000	4,200
12	\$15,000 to \$29,999	53,100	53,000	7,200	35,300	0	900	300	0	0	300	300	4,300	4,300
13	\$30,000 to \$49,999	41,000	40,200	4,600	31,100	0	0	0	0	200	200	200	1,500	2,500
14	\$50,000 to \$99,999	17,900	17,300	3,200	13,100	0	300	0	0	0	200	0	300	200
15	\$100,000 or more	4,900	4,600	400	3,800	0	0	0	0	0	200	0	200	200

Forward-Looking Table D (continued): Tenure, Housing Cost, and Income – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2004 stock	D: In 2009 stock with same characteristic, not severely damaged by Katrina	E: In 2009 stock with different characteristic, not severely damaged by Katrina	F: In 2009 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2009 stock severely damaged by Katrina but rebuilt with different characteristic	H: Loss by 2009 due to conversion or merger	I: Loss by 2009 due to house or mobile home move out	J: Loss by 2009 due to non-residential use	K: Loss by 2009 due to demolition or disaster not related to Katrina	L: Loss by 2009 due to damage or condemnation not related to Katrina	M: Loss by 2009 due to severe damage from Katrina	N: Loss by 2009 due to other causes
	Owner Monthly Housing Costs													
16	Less than \$350	136,700	114,200	19,600	82,200	0	1,100	300	0	200	300	200	5,700	4,600
17	\$350 to \$599	43,900	58,000	10,900	39,900	300	1,200	0	0	200	0	0	2,500	3,000
18	\$600 to \$799	44,500	38,400	4,000	29,100	300	600	0	0	200	0	0	2,800	1,400
19	\$800 to \$1,249	57,100	65,400	15,300	42,900	300	1,100	300	0	200	300	0	3,000	1,900
20	\$1,250 or more	40,900	47,300	24,000	18,500	300	1,100	0	0	0	0	0	1,000	2,400
	Owner Hsld Income													
21	Less than \$15,000	51,900	51,600	12,500	32,200	0	0	200	0	200	300	0	3,200	3,000
22	\$15,000 to \$29,999	60,600	63,300	12,500	43,600	0	1,800	0	0	200	0	200	2,400	2,700
23	\$30,000 to \$49,999	75,600	75,000	13,400	50,200	1,400	2,200	300	0	0	200	0	4,100	3,200
24	\$50,000 to \$99,999	83,700	84,300	26,500	49,700	300	300	200	0	300	0	0	4,000	3,000
25	\$100,000 or more	51,600	49,100	21,700	24,000	0	300	0	0	0	200	0	1,400	1,400

Backward-Looking Table A (continued): Unit and Structure Characteristics – All Housing Units

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: in 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
17	1985–89	28,400	28,500	28,100	0	200	0	0	0	0	0	0	0	200
18	1980–84	41,600	37,400	36,000	0	500	0	100	0	0	0	500	0	300
19	1975–79	63,100	63,000	61,400	0	300	0	100	0	100	0	800	0	200
20	1970–74	66,600	69,700	67,200	0	600	0	0	0	600	0	1,000	0	300
21	1960–69	82,800	86,700	85,400	0	500	0	200	0	200	0	0	0	500
22	1950–59	49,200	52,100	50,700	0	500	0	100	0	400	0	0	0	400
23	1940–49	34,700	35,700	34,000	0	800	0	100	0	300	0	0	0	500
24	1930–39	20,000	21,800	20,600	0	600	0	100	0	200	0	300	0	100
25	1920–29	16,700	13,900	13,500	0	0	0	100	0	0	0	0	0	300
26	1919 or earlier	30,800	29,300	26,700	0	500	0	200	0	1,000	0	300	0	500
	Rooms													
27	1 room	900	900	0	400	0	0	200	0	300	0	0	0	0
28	2 rooms	5,100	5,500	1,800	3,100	0	0	0	0	300	0	0	0	300
29	3 rooms	47,400	46,500	24,200	18,900	0	0	300	300	600	300	600	300	1,000
30	4 rooms	90,000	90,200	49,400	34,900	600	500	100	300	300	1,800	1,000	600	700
31	5 rooms	125,800	125,500	57,800	57,900	500	1,300	400	500	600	4,200	800	800	800
32	6 rooms	111,800	114,400	45,900	59,200	500	500	100	300	900	5,500	400	700	500
33	7 rooms	73,600	73,700	30,500	38,000	200	200	0	100	200	3,700	200	600	200
34	8 rooms	35,200	33,800	10,500	20,900	200	300	0	200	0	1,500	0	0	200
35	9 rooms	14,100	13,900	4,300	8,200	0	0	100	0	0	1,100	0	100	0
36	10 rooms or more	8,400	8,100	2,900	4,300	200	0	200	0	0	400	0	0	200

Backward-Looking Table A (continued): Unit and Structure Characteristics – All Housing Units

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: in 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
	Bedrooms													
37	None	2,000	2,500	500	1,300	0	0	200	0	300	0	0	0	200
38	1	60,900	60,100	39,000	16,400	0	100	300	300	1,200	400	900	300	1,200
39	2	129,700	126,400	85,800	32,400	1,100	800	300	200	600	2,300	1,000	900	1,000
40	3	218,600	222,700	171,700	35,000	1,200	300	300	800	900	9,300	800	1,300	1,100
41	4 or more	101,300	100,800	69,900	21,100	600	500	200	500	200	6,500	300	600	500
42	Multiunit Structures	130,200	130,100	122,600	0	700	0	300	0	1,500	1,900	1,200	300	1,600
	Stories in Structure													
43	1	NA	34,000	32,100	0	100	0	100	0	300	900	100	0	400
44	2	NA	67,400	64,000	0	600	0	200	0	800	300	900	300	400
45	3	NA	21,200	20,200	0	0	0	0	0	200	400	100	0	300
46	4 to 6	NA	3,500	2,800	0	0	0	0	0	0	400	0	0	400
47	7 or more	NA	4,100	3,500	0	0	0	0	0	300	0	0	0	200

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

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: In 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: In 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
1	Occupied Units	436,000	436,100	372,100	33,400	3,400	0	900	1,400	2,000	15,700	1,900	2,500	2,700
	Kitchen													
2	With complete kitchen	428,200	430,000	363,300	36,200	3,400	0	800	1,400	2,000	15,700	1,900	2,500	2,600
3	Lacking complete kitchen facilities	7,800	6,100	0	6,000	0	0	100	0	0	0	0	0	100
	Plumbing													
4	With all plumbing facilities	430,200	429,900	363,200	36,300	3,400	0	900	1,400	2,000	15,700	1,900	2,400	2,700
5	Lack some plumbing	5,900	6,200	200	5,800	0	0	0	0	0	0	0	100	0
	Water													
6	Public/private water	410,200	412,400	352,700	33,200	3,200	0	900	800	2,000	13,300	1,600	2,100	2,600
7	Well	25,600	23,400	18,700	900	200	0	0	600	0	2,300	300	300	100
8	Other water source	200	300	0	0	0	0	0	0	0	100	0	100	0
	Sewer													
9	Public sewer	399,600	403,100	342,900	34,200	3,100	0	900	800	2,000	13,200	1,600	1,800	2,600
10	Septic tank/cesspool	36,400	33,000	24,600	3,800	200	200	0	600	0	2,500	300	700	200
11	Other	0	0	0	0	0	0	0	0	0	0	0	0	0

Backward-Looking Table B (continued): Condition of Unit – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: in 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
12	Severe Problems	8,400	9,200	200	8,700	0	0	0	0	0	0	0	100	200
13	Plumbing	5,900	6,200	200	5,800	0	0	0	0	0	0	0	100	0
14	Heating	1,900	2,000	0	1,900	0	0	0	0	0	0	0	0	200
15	Upkeep	800	1,100	0	1,100	0	0	0	0	0	0	0	0	0
17	Moderate problems	21,800	20,500	6,200	13,800	200	0	100	0	0	0	0	0	200
18	Plumbing	1,100	1,700	200	1,500	0	0	0	0	0	0	0	0	0
19	Heating	7,900	9,200	6,400	2,500	200	0	100	0	0	0	0	0	100
20	Kitchen	7,200	6,100	0	6,000	0	0	100	0	0	0	0	0	100
21	Upkeep	6,500	6,300	400	5,900	0	0	0	0	0	0	0	0	100

Backward-Looking Table C: Household Characteristics – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: in 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
1	Occupied units	436,000	436,100	372,100	33,400	3,400	0	900	1,400	2,000	15,700	1,900	2,500	2,700
	Age													
2	Under 65	345,600	341,400	263,600	52,800	1,600	200	700	1,400	1,500	14,600	1,400	1,700	1,900
3	65 to 74	49,500	51,500	16,000	32,000	700	700	100	0	200	400	500	400	700
4	75 or older	41,000	43,200	22,800	18,300	0	300	100	0	300	700	0	400	200
	Children													
5	Some	138,700	142,300	74,100	56,300	800	300	300	1,100	300	7,100	300	900	800
6	None	296,100	293,800	197,500	77,600	2,100	200	600	300	1,700	8,600	1,600	1,700	2,000
	Race/Origin													
7	White	284,500	279,600	227,400	33,600	1,800	0	600	1,400	900	10,000	1,100	1,400	1,400
8	Hispanic	31,900	32,300	15,500	15,300	300	0	100	0	200	1,000	0	0	0
9	Non-Hispanic	252,600	247,400	201,700	28,500	1,500	0	500	1,400	800	9,000	1,100	1,400	1,400
10	Black	135,000	141,100	98,300	32,600	1,600	0	200	0	900	4,300	800	1,200	1,200
11	Hispanic	1,900	2,100	600	1,500	0	0	0	0	0	0	0	0	0
12	Non-Hispanic	133,100	139,000	96,000	32,800	1,600	0	200	0	900	4,300	800	1,200	1,200
13	American Indian, Eskimo, Aleut	3,100	3,000	900	1,800	0	0	0	0	0	100	0	0	100
14	Asian	8,200	8,100	4,100	3,000	0	0	100	0	200	700	0	0	0
15	Pacific Islander	1,200	1,100	0	1,100	0	0	0	0	0	0	0	0	0
16	Two or more races	4,000	3,200	1,300	1,300	0	0	0	0	0	500	0	0	0
17	Total Hispanics	35,700	36,200	17,100	17,500	300	0	100	0	200	1,000	0	0	0

Backward-Looking Table C (continued): Household Characteristics – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: in 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
	Income Source													
18	Wages and salaries	311,400	306,800	228,300	56,700	1,800	300	500	600	600	13,700	1,300	1,400	1,500
19	Social Security or pension	NA	104,800	58,500	38,800	1,500	300	300	500	800	1,800	500	1,000	900
20	Dividend or interest	NA	92,200	42,500	42,900	200	1,000	200	0	500	4,000	300	300	400
21	Welfare	7,500	7,700	400	6,600	0	200	0	0	200	100	0	300	0

Backward-Looking Table D: Tenure, Housing Cost, and Income – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: in 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
1	Occupied units	436,000	436,100	372,100	33,400	3,400	0	900	1,400	2,000	15,700	1,900	2,500	2,700
	Tenure													
2	Owner-occupied	290,400	290,400	238,000	28,900	2,900	500	500	1,300	500	12,900	1,000	2,500	1,400
3	Homeownership rate	66.6%	66.6%											
4	Renter-occupied	145,700	145,700	91,400	47,200	0	0	400	200	1,500	2,800	900	0	1,300
	Renter Monthly Housing Costs													
5	Less than \$350	10,200	11,000	3,600	6,400	0	0	100	0	300	100	200	0	300
6	\$350 to \$599	18,200	19,900	7,700	11,100	0	0	100	0	200	200	500	0	100
7	\$600 to \$799	27,700	27,300	4,500	21,900	0	0	0	0	300	400	0	0	100
8	\$800 to \$1,249	57,700	56,500	6,500	48,000	0	0	0	200	500	800	300	0	200
9	\$1,250 or more	20,800	21,600	2,100	18,300	0	0	0	0	0	1,100	0	0	200
10	No cash rent	11,100	9,400	900	7,700	0	0	100	0	300	100	0	0	200
	Renter Hsld Income													
11	Less than \$15,000	49,700	50,600	14,800	32,500	0	0	300	200	900	800	300	0	900
12	\$15,000 to \$29,999	31,500	32,200	7,100	23,800	0	0	0	0	500	500	200	0	100
13	\$30,000 to \$49,999	32,200	31,000	4,500	25,400	0	0	100	0	200	400	500	0	0
14	\$50,000 to \$99,999	25,400	25,800	3,200	21,700	0	0	0	0	0	900	0	0	100
15	\$100,000 or more	6,800	6,200	400	5,400	0	0	0	0	0	200	0	0	200

Backward-Looking Table D (continued): Tenure, Housing Cost, and Income – All Occupied Units

	A: Characteristics	B: Published numbers	C: In 2009 stock	D: In 2004 stock with same characteristic, not severely damaged by Katrina	E: In 2004 stock with different characteristic, not severely damaged by Katrina	F: in 2004 stock severely damaged by Katrina but rebuilt with same characteristic	G: in 2004 stock severely damaged by Katrina but rebuilt with different characteristic	H: Added by conversion or merger	I: Added by house or mobile home move in	J: Added from non-residential use	K: Added by new construction	L: Added from temporary loss	M: Added after 2004, destroyed by Katrina and rebuilt	N: Added in other ways
	Owner Monthly Housing Costs													
16	Less than \$350	45,300	39,300	18,800	17,700	0	500	0	500	0	600	300	700	200
17	\$350 to \$599	66,700	64,800	10,800	50,500	200	1,300	100	200	200	500	0	800	400
18	\$600 to \$799	30,700	32,900	4,100	25,400	200	600	0	0	200	1,400	300	400	200
19	\$800 to \$1,249	64,400	67,200	15,800	47,400	200	300	200	300	0	2,400	0	100	400
20	\$1,250 or more	83,200	86,200	24,800	51,600	200	0	200	300	200	8,000	300	400	200
	Owner Hsld Income													
21	Less than \$15,000	43,800	43,200	12,100	27,200	0	300	100	500	0	1,300	300	1,200	200
22	\$15,000 to \$29,999	48,600	50,000	12,500	35,000	0	800	100	0	200	1,000	200	0	300
23	\$30,000 to \$49,999	50,900	51,300	13,600	33,800	800	300	100	200	200	1,900	0	400	200
24	\$50,000 to \$99,999	85,000	85,000	26,700	51,300	200	600	100	500	200	4,300	500	100	500
25	\$100,000 or more	62,200	60,900	22,400	32,400	0	300	200	200	0	4,400	0	700	200

Hurricane Katrina and Other Losses to the New Orleans Housing Stock

Forward-Looking Tables A through D provide a detailed description of what happened by 2009 to the units that composed the 2004 housing stock in New Orleans. The small sample sizes limit the reliability of the estimates, particularly when one considers minor subsets of the housing stock such as zero-bedroom units, of which there were only 3,700 in 2004 based on the published AHS numbers. For this reason, the discussion in this section will focus on two aggregations of the data presented in Forward-Looking Tables A through D.

- **Lost units:** Units that were in the 2004 stock and were no longer in the stock in 2009. This group combines columns H through N and includes both permanent losses and losses that could be reversed.
- **Hurricane Katrina units:** Units that were severely damaged or destroyed by Hurricane Katrina. This group includes the units in columns F, G, and M. This group includes both units that are not in the stock in 2009 (column M) and units that had returned to the stock (columns F and G). The units in column M include both permanent losses (units that will never return to the stock) and temporary losses (units that will still be repaired and returned to the stock in later years).

Table 2 surveys Forward-Looking Tables A through D and identifies the subsets of the housing stock where either the loss rate or the Hurricane Katrina rate appears to be different from the corresponding rate for the full stock.¹⁸ For example, the first page of Table 2 deals with the unit and structure characteristics from Table A. The first row reports that 12.4 percent of all the units in the 2004 housing stock were no longer in the stock by 2009 and that 7.2 percent of all the units had been severely damaged or destroyed by Hurricane Katrina. Subsequent rows report the same percentages for various unit and structural characteristics. For example, the third row reports that 19.4 percent of all vacant units in the 2004 housing stock were no longer in the stock by 2009 and that 9.8 percent of all units that were vacant in 2004 had been severely damaged or destroyed by Hurricane Katrina. The 19.4 percent is bolded because it is more than 1.65 standard deviations different from the 12.4 percent reported for all units; the 9.8 percent is not bolded because it is less than 1.65 standard deviations away from the 7.2 percent reported for all units.¹⁹ Table 2 does not contain the loss rates or Hurricane Katrina rates for occupied units or seasonal units because none of these rates was considered statistically significant. In other words, Table 2 only reports the loss and Hurricane Katrina rates if one of the two rates appears to be different from the corresponding rate for all units.²⁰

¹⁸ The rates were calculated using unrounded numbers.

¹⁹ The normal criterion for a difference to be considered statistically significant at the 0.10 level in a two-sided test is 1.65 standard deviations. We will treat differences greater than 1.65 standard deviations as statistically significant differences, even though proper use of this standard would have required minor adjustments to the 1.65 criterion to take into account repeated use of the same sample.

²⁰ We also omit subsets if the only statistically significant measured rate is a rate of zero, that is, if there were no sample cases that were lost or severely damaged or destroyed. In this case, the test of statistical differences collapses to a test that the overall rate is different from zero.

Table 2: Units Lost and Units Severely Damaged or Destroyed by Hurricane Katrina

Characteristic	Units in 2004	Units lost, not including rebuilt units	Units severely damaged or destroyed by Katrina, including rebuilt units	Percent lost, not including rebuilt units*	Percent severely damaged or destroyed by Katrina, including rebuilt units*
Total Housing Stock	561,100	69,400	40,400	12.4%	7.2%
Vacant	58,900	11,500	5,800	19.4%	9.8%
Single unit, attached	49,200	8,500	4,100	17.2%	8.2%
Unit in building with 5 to 9 units	19,600	3,700	2,400	19.0%	12.0%
Built 2000–04	19,300	500	0	2.5%	0.0%
Built 1990–94	19,000	1,400	1,000	7.2%	5.5%
Built 1985–89	33,300	2,100	1,200	6.2%	3.7%
Built 1980–84	44,100	3,900	3,400	8.7%	7.8%
Built 1975–79	66,600	4,900	2,700	7.4%	4.1%
Built 1950–59	61,100	10,300	7,200	16.9%	11.7%
Built 1940–49	47,200	12,200	6,200	25.8%	13.2%
Built 1930–39	26,600	5,200	2,300	19.7%	8.7%
Built 1920–29	16,200	2,500	500	15.6%	2.8%
1 room	1,000	500	0	47.2%	0.0%
3 rooms	49,400	8,800	4,200	17.8%	8.5%
4 rooms	111,300	18,700	10,900	16.8%	9.8%
7 rooms	75,000	5,600	2,800	7.4%	3.7%
8 rooms	33,100	2,500	1,100	7.6%	3.2%
9 rooms	14,600	600	1,000	4.3%	7.0%
Zero bedrooms	4,400	1,300	600	29.0%	14.4%
2 bedrooms	151,400	25,400	14,200	16.8%	9.4%
3 bedrooms	243,200	24,900	15,700	10.2%	6.5%
4 or more bedrooms	98,400	8,100	5,400	8.2%	5.4%
Multiunit Structures	132,400	19,700	9,300	14.9%	7.1%
2 stories	71,900	11,300	5,400	15.6%	7.5%

* Percentages in bold type are significantly different from that of all housing units at 10-percent level, two-sided test.

Table 2 (continued): Units Lost and Units Severely Damaged or Destroyed by Hurricane Katrina

Characteristic	Units in 2004	Units lost, not including rebuilt units	Units severely damaged or destroyed by Katrina, including rebuilt units	Percent lost, not including rebuilt units*	Percent severely damaged or destroyed by Katrina, including rebuilt units*
Occupied Units	498,200	56,900	34,400	11.4%	6.9%
Well	28,400	800	600	2.8%	2.1%
Septic tank/cesspool	37,600	1,900	800	5.1%	2.0%
Moderate problems	33,400	7,800	5,000	23.4%	14.9%
Moderate heating problem	17,800	5,200	2,500	29.2%	14.1%
Moderate upkeep problem	11,200	2,100	2,000	19.0%	18.1%
Householder 65 to 74	54,800	6,600	5,700	12.0%	10.4%
Householder 75 or older	49,300	5,500	2,200	11.1%	4.5%
Some children	173,900	18,500	9,000	10.6%	5.2%
White householder	309,700	24,200	18,600	7.8%	6.0%
Black, Non-Hispanic Householder	173,500	31,400	14,700	18.1%	8.4%
Hispanic Householder	29,300	2,100	1,800	7.2%	6.3%
Social Security or pension	143,600	18,000	13,500	12.5%	9.4%
Welfare	10,300	2,500	1,400	24.0%	14.1%

* Percentages in bold type are significantly different from that of all occupied units at 10-percent level, two-sided test.

Table 2 (continued): Units Lost and Units Severely Damaged or Destroyed by Hurricane Katrina

Characteristic	Units in 2004	Units lost, not including rebuilt units	Units severely damaged or destroyed by Katrina, including rebuilt units	Percent lost, not including rebuilt units*	Percent severely damaged or destroyed by Katrina, including rebuilt units*
Occupied Units	498,200	56,900	34,400	11.4%	6.9%
Owner-occupied	323,300	30,500	21,400	9.4%	6.6%
Renter-occupied	174,900	26,400	13,000	15.1%	7.5%
Rent Less than \$350	20,700	4,300	2,800	20.9%	13.4%
Rent \$350 to \$599	62,500	11,800	5,400	18.9%	8.6%
No cash rent	10,800	2,300	1,500	21.5%	13.8%
Renter income less than \$15,000	59,700	11,100	5,600	18.7%	9.3%
Renter income \$15,000 to \$29,999	53,000	9,600	5,200	18.2%	9.8%
Renter income \$30,000 to \$49,999	40,200	4,500	1,500	11.2%	3.7%
Renter income \$50,000 to \$99,999	17,300	700	600	3.8%	3.6%
Owner costs \$1,250 or more	47,300	3,300	2,400	7.1%	5.0%
Owner income \$15,000 to \$29,999	63,300	5,400	4,200	8.5%	6.6%
Owner income \$30,000 to \$49,999	75,000	7,800	7,700	10.3%	10.3%
Owner income \$50,000 to \$99,999	84,300	7,500	4,500	8.9%	5.4%
Owner income \$100,000 or more	49,100	3,000	1,700	6.2%	3.5%

* Percentages in bold type are significantly different from that of all occupied units at 10-percent level, two-sided test.

Before discussing Table 2, we want to remind the reader that the number of units severely damaged or destroyed by Hurricane Katrina rate is *not* a subset of the number of units lost, because the number of units severely damaged or destroyed by Hurricane Katrina rate includes units that were rebuilt.

Among the structure type categories, only single units in attached structures and units in buildings with five to nine units had loss rates statistically different from the overall loss rate. In both cases, the categories experienced greater losses between 2004 and 2009 than all units, losing between 1/6 and 1/5 of all 2004 units of similar structure type. The Hurricane Katrina rates did not vary in a statistically significant way by structure type.

The age of a unit had an important bearing on the likelihood that the unit would survive from 2004 to 2009. Almost all the loss rates by age category were statistically different from the overall loss rate, with younger units having lower than average loss rates and older unit units having higher than average loss rates. A number of the Hurricane Katrina rates by age category were also statistically significant. The lower than average Hurricane Katrina rates for recently built units probably result more from the location of these units than any differences in structural soundness.

Smaller units appear to have substantially higher loss rates than larger units. While fewer of the Hurricane Katrina rates by unit size are statistically different from the overall Hurricane Katrina rate, the pattern is generally the same.²¹

Units in multistory structures had higher than average loss rates.

The second page of Table 2 reports the key results from Forward-Looking Tables B and C. For this page, the relevant comparison involves all occupied units, which had an 11.4-percent loss rate and a 6.9-percent Hurricane Katrina rate.

With respect to the unit quality measures, the most interesting finding is that the loss rates and Hurricane Katrina rates for units without complete kitchens, units with complete plumbing, and units with severe physical problems were *not* statistically different from the corresponding rates for all occupied units. The measured loss rates for these categories were higher than the loss rate for all occupied units but not statistically different. These conditions are rare, and therefore the sample sizes for these categories are small. The Hurricane Katrina rates were mixed, higher than all occupied units for units lacking complete kitchens and units with severe physical problems and lower for units lacking complete plumbing, but none of the differences was statistically significant.

The lower loss rates and Hurricane Katrina rates for units with well or septic systems probably reflect younger age and location outside the City of New Orleans. Units with moderate physical problems did have substantial loss rates and Hurricane Katrina rates.

²¹ The zero-percent Hurricane Katrina rate for one-room structures results from the fact that there were only six one-room units in the 2004 sample.

There are several statistically significant differences among the Hurricane Katrina rates reported by demographic characteristic. Households with children and households whose householder was 75 years old or older in 2004 had lower than average Hurricane Katrina rates, while households with householders whose age was between 65 and 74 in 2004 and households reporting income from pensions or Social Security or from welfare had higher than average Hurricane Katrina rates. These differences most likely result from the location of the housing units occupied by these households. There were no statistically significant differences in the loss rates for these groups.

Loss rates did differ by the race and ethnicity of the householder, with a lower than average loss rate reported by units occupied by households with White or Hispanic householders, and a higher than average loss rate reported by units occupied by households with a Black, non-Hispanic householder. The Hurricane Katrina rates did not vary in a statistically significant way by race or ethnicity.

The third page of Table 2 contains the key findings from Forward-Looking Table D, which examines tenure by housing costs and household income. Again the loss rate and Hurricane Katrina rate for all occupied units are the bases against which the corresponding rates for the various subsets are compared.

Owner-occupied units had lower than average loss rates, while renter-occupied units had higher than average loss rates. Among renter households, those living in units with low rents or no cash rents and those occupied by the lowest-income households had the highest loss rates. Renter households with incomes between \$50,000 and \$99,999 had lower than average loss rates.

Among owner households, those living in units with the highest cost of housing and those with the highest incomes had lower than average loss rates. Owner households with income under \$15,000 also had lower than average loss rates.

The only Table D groups with Hurricane Katrina rates greater than the average for all occupied households were renter households paying less than \$350 for rent and utilities and owner households with incomes between \$30,000 and \$49,999. The only Table D groups with Hurricane Katrina rates less than the average for all occupied households were owner households with incomes over \$100,000 and renter households with incomes between \$30,000 and \$49,999.

Repairs, New Construction, and Other Additions

Backward-Looking Tables A through D provide a detailed description of where units in the 2009 housing stock in New Orleans came from with reference to the 2004 housing stock. Table 3 surveys Backward-Looking Tables A through D and identifies subsets of the housing stock that had particularly interesting changes over this period. Once again small sample sizes limit the reliability of the estimates, so the discussion in this section focuses on four aggregations of the data presented in Backward-Looking Tables A through D.

- **All units rebuilt or added:** Units in the 2009 housing stock that were severely damaged or destroyed by Hurricane Katrina and rebuilt and units that were added to the New

Orleans housing stock after 2004. This group combines columns F through N and includes both new units and repaired units.

- **Rebuilt units:** Units that were in the 2004 housing stock or were added to the New Orleans housing stock before September 2005, that were severely damaged or destroyed by Hurricane Katrina, and that were rebuilt. This group combines columns F, G, and M.
- **New construction units:** Units that were added to the New Orleans housing stock after the 2004 AHS by new construction and that were not severely damaged or destroyed by Hurricane Katrina. This group consists of the units reported in column K.
- **Other addition units:** Units that were added to the New Orleans housing stock after the 2004 AHS by means other than new construction and that were not severely damaged or destroyed by Hurricane Katrina. This group consists of the units reported in columns H, I, J, L, and N.

These aggregates are defined so that the all units rebuilt or added group equals the sum of the rebuilt, new construction, and other additions groups.

Table 3 surveys Backward-Looking Tables A through D and identifies the subsets of the housing stock where one of the following rates appear to be different from the corresponding rate for the full stock: all units rebuilt or added rate, rebuilt rate, new construction rate, or other addition rate.²² For example, the first page of Table 3 deals with the unit and structure characteristics from Table A. The first row reports that 7.7 percent of all the units in the 2009 New Orleans housing stock were either rebuilt or added, 1.5 percent were rebuilt, 3.6 percent were newly constructed, and 2.6 percent were other additions. Subsequent rows report the same percentages for various unit and structural characteristics. For example the third row reports that, among vacant units in 2009, 11.5 percent were either rebuilt or added, 2.6 percent were rebuilt, 3.8 percent were newly constructed, and 5.2 percent were other additions. The 11.5-percent and 5.2-percent rates are bolded because they are more than 1.65 standard deviations different from the 7.7-percent and 2.6-percent rates reported for all units; the 2.6-percent and 3.8-percent rates are not bolded because they are less than 1.65 standard deviations away from the 1.5-percent and 3.6-percent rates reported for all units.²³ The first page of Table 3 does not contain data on occupied units because none of the four rates for occupied units was considered statistically different from the corresponding rates for all units.²⁴

²² The rates were calculated using unrounded numbers.

²³ The normal criterion for a difference to be considered statistically significant at the 0.10 level in a two-sided test is 1.65 standard deviations. We will treat differences greater than 1.65 standard deviations as statistically significant differences, even though proper use of this standard would have required minor adjustments to the 1.65 criterion to take into account repeated use of the same sample.

²⁴ The data on occupied units are reported in the first row on the third and fourth pages of Table 3 because all the other rows on those pages are subsets of occupied units.

Table 3: Units Rebuilt or Added

Characteristic	Units in 2009	Units rebuilt or added	Units rebuilt	New construction	Other additions	Percentage*			
						Rebuilt or added	Rebuilt	New construction	Other additions
Total Housing Stock	512,500	39,400	7,800	18,600	13,100	7.7%	1.5%	3.6%	2.6%
Occupancy Status									
Vacant	71,700	8,300	1,800	2,700	3,800	11.5%	2.6%	3.8%	5.2%
Seasonal	4,700	600	0	200	400	12.0%	0.0%	3.2%	8.7%
Units in Structure									
1, detached	331,200	24,600	5,100	15,100	4,400	7.4%	1.5%	4.6%	1.3%
1, attached	30,600	2,600	100	1,500	1,000	8.6%	0.5%	5.0%	3.1%
2 to 4	71,400	2,800	100	900	1,800	3.9%	0.2%	1.2%	2.5%
5 to 9	19,300	2,100	600	100	1,400	10.9%	3.0%	0.7%	7.1%
10 to 19	13,900	400	300	0	100	2.9%	1.9%	0.0%	1.0%
20 to 49	12,500	1,000	0	500	400	7.7%	0.0%	4.2%	3.5%
50 or more	13,000	1,300	0	400	900	9.8%	0.0%	3.0%	6.8%
Mobile Home/trailer	20,600	4,700	1,600	0	3,100	22.9%	7.6%	0.0%	15.3%
Year Built									
2005–09	17,300	17,300	2,800	12,700	1,900	100.0%	16.1%	73.1%	10.8%
2000–04	26,600	6,900	400	5,800	700	25.9%	1.6%	21.7%	2.7%
1990–94	16,400	200	200	0	100	1.4%	1.0%	0.0%	0.5%
1985–89	28,500	400	200	0	200	1.3%	0.6%	0.0%	0.7%
1980–84	37,400	1,400	500	0	900	3.7%	1.3%	0.0%	2.4%
1975–79	63,000	1,500	300	0	1,200	2.4%	0.5%	0.0%	1.9%
1970–74	69,700	2,600	600	0	1,900	3.7%	0.9%	0.0%	2.8%
1960–69	86,700	1,300	500	0	800	1.5%	0.5%	0.0%	0.9%
1950–59	52,100	1,400	500	0	900	2.6%	1.0%	0.0%	1.7%
1940–49	35,700	1,700	800	0	900	4.7%	2.2%	0.0%	2.5%
1920–29	13,900	400	0	0	400	3.1%	0.0%	0.0%	3.1%
1919 or earlier	29,300	2,600	500	0	2,100	8.8%	1.6%	0.0%	7.1%

* Percentages in bold type are significantly different from that of all housing units at 10-percent level, two-sided test.

Table 3 (continued): Units Rebuilt or Added

Characteristic	Units in 2009	Units rebuilt or added	Units rebuilt	New construction	Other additions	Percentage*			
						Rebuilt or added	Rebuilt	New construction	Other additions
Total Housing Stock	512,500	39,400	7,800	18,600	13,100	7.7%	1.5%	3.6%	2.6%
Rooms									
1 room	900	500	0	0	500	58.7%	0.0%	0.0%	58.7%
2 rooms	5,500	600	0	0	600	10.8%	0.0%	0.0%	10.8%
3 rooms	46,500	3,400	300	300	2,900	7.4%	0.6%	0.6%	6.2%
4 rooms	90,200	5,900	1,600	1,800	2,500	6.5%	1.8%	2.0%	2.7%
7 rooms	73,700	5,300	900	3,700	700	7.2%	1.2%	5.0%	0.9%
8 rooms	33,800	2,400	500	1,500	400	7.1%	1.4%	4.6%	1.1%
9 rooms	13,900	1,400	100	1,100	100	9.7%	1.0%	8.1%	0.5%
Bedrooms									
None	2,500	700	0	0	700	26.8%	0.0%	0.0%	26.8%
1	60,100	4,800	400	400	3,900	7.9%	0.7%	0.7%	6.5%
2	126,400	8,100	2,800	2,300	3,000	6.4%	2.2%	1.8%	2.4%
3	222,700	16,000	2,800	9,300	3,900	7.2%	1.3%	4.2%	1.8%
4 or more	100,800	9,800	1,700	6,500	1,600	9.8%	1.7%	6.5%	1.6%
Multiunit Structures	130,100	7,500	1,000	1,900	4,600	5.8%	0.8%	1.5%	3.5%
Stories in Structure									
1	34,000	1,900	100	900	900	5.5%	0.4%	2.5%	2.6%
2	67,400	3,400	800	300	2,200	5.0%	1.3%	0.4%	3.3%
3	21,200	1,000	0	400	600	4.6%	0.0%	1.9%	2.8%
4 to 6	3,500	700	0	400	400	21.4%	0.0%	11.1%	10.3%
7 or more	4,100	500	0	0	500	13.0%	0.0%	0.0%	13.0%

* Percentages in bold type are significantly different from that of all housing units at 10-percent level, two-sided test.

Table 3 (continued): Units Rebuilt or Added

Characteristic	Units in 2009	Units rebuilt or added	Units rebuilt	New construction	Other additions	Percentage*			
						Rebuilt or added	Rebuilt	New construction	Other additions
Occupied Units	436,100	30,600	5,900	15,700	8,900	7.0%	1.4%	3.6%	2.1%
Lacking complete kitchen facilities	6,100	100	0	0	100	2.4%	0.0%	0.0%	2.4%
Lack some plumbing	6,200	100	100	0	0	2.3%	2.3%	0.0%	0.0%
Well	23,400	3,800	500	2,300	1,000	16.2%	2.0%	9.8%	4.4%
Septic tank/cesspool	33,000	4,600	1,000	2,500	1,100	14.0%	3.2%	7.5%	3.4%
Severe Problems	9,200	300	100	0	200	3.2%	1.5%	0.0%	1.7%
Plumbing	6,200	100	100	0	0	2.3%	2.3%	0.0%	0.0%
Heating	2,000	200	0	0	200	7.4%	0.0%	0.0%	7.4%
Upkeep	1,100	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Moderate problems	20,500	500	200	0	400	2.6%	0.8%	0.0%	1.8%
Plumbing	1,700	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Heating	9,200	300	200	0	100	3.4%	1.7%	0.0%	1.6%
Kitchen	6,100	100	0	0	100	2.4%	0.0%	0.0%	2.4%
Upkeep	6,300	100	0	0	100	1.2%	0.0%	0.0%	1.2%
Age of Householder									
65 to 74	51,500	3,500	1,700	400	1,400	6.8%	3.3%	0.8%	2.7%
75 or older	43,200	2,100	800	700	600	4.8%	1.8%	1.6%	1.4%
Race/Ethnicity of Householder									
Hispanics	36,200	1,500	300	1,000	200	4.3%	0.9%	2.7%	0.6%
Income Source									
Social Security or pension	104,800	7,500	2,700	1,800	2,900	7.2%	2.6%	1.8%	2.8%

* Percentages in bold type are significantly different from that of all occupied units at 10-percent level, two-sided test.

Table 3 (continued): Units Rebuilt or Added

Characteristic	Units in 2009	Units rebuilt or added	Units rebuilt	New construction	Other additions	Percentage*			
						Rebuilt or added	Rebuilt	New construction	Other additions
Occupied Units	436,100	30,600	5,900	15,700	8,900	7.0%	1.4%	3.6%	2.1%
Renter-occupied	145,700	7,100	0	2,800	4,300	4.9%	0.0%	1.9%	2.9%
Renter Monthly Housing Costs									
Less than \$350	11,000	1,000	0	100	900	9.5%	0.0%	1.3%	8.2%
\$350 to \$599	19,900	1,200	0	200	900	5.9%	0.0%	1.2%	4.7%
\$600 to \$799	27,300	900	0	400	500	3.2%	0.0%	1.6%	1.7%
\$800 to \$1,249	56,500	1,900	0	800	1,200	3.4%	0.0%	1.4%	2.0%
Renter Hsld Income									
Less than \$15,000	50,600	3,400	0	800	2,600	6.7%	0.0%	1.5%	5.1%
\$15,000 to \$29,999	32,200	1,300	0	500	800	4.0%	0.0%	1.7%	2.4%
\$30,000 to \$49,999	31,000	1,100	0	400	700	3.6%	0.0%	1.4%	2.3%
\$50,000 to \$99,999	25,800	900	0	900	100	3.6%	0.0%	3.3%	0.3%
Owner Monthly Housing Costs									
Less than \$350	39,300	2,800	1,200	600	1,000	7.2%	3.1%	1.4%	2.7%
\$350 to \$599	64,800	3,500	2,200	500	800	5.4%	3.5%	0.8%	1.2%
\$600 to \$799	32,900	3,400	1,200	1,400	700	10.2%	3.8%	4.3%	2.1%
\$1,250 or more	86,200	9,800	600	8,000	1,200	11.4%	0.7%	9.3%	1.4%
Owner Hsld Income									
Less than \$15,000	43,200	4,000	1,600	1,300	1,100	9.2%	3.7%	3.0%	2.6%
\$100,000 or more	60,900	6,100	1,000	4,400	600	10.0%	1.7%	7.3%	1.0%

* Percentages in bold type are significantly different from that of all occupied units at 10-percent level, two-sided test.

Among the structure type categories, units in 2–4 unit structures and units in structures with 10–19 units had lower than average rebuilt or addition rates. The rate of rebuilding was lower than average for single-family attached units and units in structures with 2–4 units, 20–49 units, and 50-plus units. The rate of new construction was lower than average for units in structures with 2–4 units, 5–9 units, and 10–19 units. The other additions rate was below average for single-family detached units.

The statistically significant rates for manufactured (mobile) homes are difficult to interpret because of the small sample sizes that support them. Table 3 says that 1,600 of these units were rebuilt; Backward-Looking Table A breaks the 1,600 into 700 that were part of the 2004 housing stock and 900 that were added after 2004 but before Hurricane Katrina. The 700 estimate is based on two sample units, one of which was not a mobile home in 2004.

The year-built results are also difficult to interpret because of questions about the accuracy with which respondents reported year built. As discussed on page 13, there is the anomaly of finding in the 2009 survey units that are both newly constructed units and built over 5 years earlier. This is most likely the result of misreporting by respondents. One also has to wonder about the accuracy of the year-built responses for the 2,800 units reported rebuilt in structures constructed after 2004 and the 1,900 units that were reportedly added to the stock by other means from structures constructed after 2004.

The unit size results are reported on page 2 of Table 3. None of the smallest units—one- or two-room units or zero-bedroom units—was the product of new construction or of rebuilding after Hurricane Katrina. All of these units were created by means other than new construction. The new construction rates were below average for three- and four-room units and for one- and two-bedroom units.

The third page of Table 3 contains the key findings from Backward-Looking Tables B and C. The rates for all occupied units are reported in the first row, and these rates are used as the base case in determining whether a rate or rates for a specific category are different from the average rate.

As expected, units that were rebuilt or added to the stock have lower proportions that lack complete kitchen facilities, lack complete plumbing, or have moderate physical problems. Units with severe physical problems also have a lower than average rate of units rebuilt or added, but in this instance, the difference is not statistically significant. None of the 2009 units that lack complete kitchen facilities or complete plumbing or have either severe or moderate physical problems was newly constructed.

The four rates were also calculated for all the demographic groups in Backward-Looking Table C, but only a few of the calculated rates were statistically different from the corresponding rates for all households. Older householders—those between 65 and 74 and those over 75—were less likely to live in a newly constructed unit but more likely to live in a rebuilt unit. Households that received pension income or Social Security were also less likely to live in a newly constructed unit, while householders between the ages of 65 and 74 were more likely to live in a rebuilt unit.

Households with Hispanic householders were less likely to live in a unit that had been rebuilt or added to the stock after 2004.

The final page of Table 4 summarizes the key results from Backward-Looking Table D. Again all the rates are tested against the corresponding rates for all occupied units.

Renter households were less likely to live in units that had been rebuilt or added; in fact, none of the rebuilt units was renter-occupied in 2009. The rate of new construction was very low for rental units in general; only 1.9 percent of renter-occupied units had been constructed after 2004. The rates of other additions were particularly high for units that rented for less than \$350, including utilities, or that were occupied by renter households who earn less than \$15,000.

The rebuilt rates were above average for owners with monthly housing costs between \$350 and \$599 and between \$600 and \$799, and for owner households earning less than \$15,000.

The new construction rate was very high among owner households earning more than \$100,000.

Rental Market Dynamics

Tables 4 through 8 present the rental market dynamics analysis. Rental market dynamics differs in two ways from the analysis in rows 5–10 in Table D of both the forward-looking and backward-looking tables. First, rental market dynamics uses categories (rows) based on affordability instead of absolute dollar amount. Affordability is defined relative to local area median income, measured at the same time that monthly housing costs are measured. Tables 4 through 8 use the following eight categories:

- Nonmarket (either no cash rent or a subsidized rent).
- Extremely low rent (monthly housing costs affordable to renters with incomes less than or equal to 30 percent of local area median income).
- Very low rent (monthly housing costs affordable to renters with incomes greater than 30 percent but less than or equal to 50 percent of local area median income).
- Low rent (monthly housing costs affordable to renters with incomes greater than 50 percent but less than or equal to 60 percent of local area median income).
- Moderate rent (monthly housing costs affordable to renters with incomes greater than 60 percent but less than or equal to 80 percent of local area median income).
- High rent (monthly housing costs affordable to renters with incomes greater than 80 percent but less than or equal to 100 percent of local area median income).

- Very high rent (monthly housing costs affordable to renters with incomes greater than 100 percent but less than or equal to 120 percent of local area median income).
- Extremely high rent (monthly housing costs affordable to renters with incomes greater than 120 percent of local area median income).

The second difference is that rental market dynamics uses different columns in order to highlight changes in availability and affordability. Columns A through I duplicate the rows so that one can trace how rental units change their affordability status. Columns J and K track movement into or out of the owner-occupied stock or the seasonal or vacant stock, respectively. In Tables 4 and 5, the various types of losses are combined in column L, while in Tables 7 and 8, new construction is recorded in column L and all other additions in column M.

Table 4 shows that there were 205,300 rental units in the New Orleans metropolitan area in 2004. This total is substantially larger than the number reported in Forward-Looking Table D (174,900) because the Table 4 total includes vacant units offered for rent, vacant units that are offered for sale or rent, and vacant units that have already been rented but not yet occupied.²⁵

The New Orleans housing market had a high rental vacancy rate (14.4 percent) in 2004. Hurricane Katrina affected this already stressed rental market in two ways: it reduced supply by destroying a number of rental units, and it reduced demand by driving many renter households away from the New Orleans area. The net result was an even higher vacancy rate in 2009 (20.1 percent) and also a more affordable housing market. According to Table 4, none of rental stock in 2004 wound up as either very high-rent or extremely high-rent units in 2009, and Table 7 shows that there were only 1,000 units in these two categories in 2009.

²⁵ The 2004 New Orleans AHS report indicates that there were 29,400 units in the first two of these three classes of unoccupied rental units.

Table 4: Forward-Looking Rental Dynamics Analysis, Counts: 2004–09

Affordability groups	A Total in 2004	B Non- Market in 2009	C Extremely Low Rent in 2009	D Very Low Rent in 2009	E Low Rent in 2009	F Moderate Rent in 2009	G High Rent in 2009	H Very High Rent in 2009	I Extremely High Rent in 2009	J Owner Occupied in 2009	K Seasonal or URE in 2009	L Lost to Stock in 2009
Nonmarket	38,100	7,600	2,800	9,300	2,500	700	200	0	0	6,200	400	8,400
Extremely Low Rent	13,000	2,500	2,900	1,700	400	200	0	0	0	700	1,800	2,800
Very Low Rent	74,000	7,300	7,100	30,600	4,500	2,500	500	0	0	6,000	2,500	12,900
Low Rent	40,600	3,400	1,500	20,300	3,700	1,300	400	0	0	2,100	3,100	4,900
Moderate Rent	26,900	1,600	1,700	9,100	4,500	2,200	700	0	0	4,300	400	2,400
High Rent	5,900	200	0	1,300	1,500	1,100	0	0	0	1,400	400	0
Very High Rent	4,000	200	0	700	500	700	400	0	0	1,100	200	200
Extremely High Rent	2,800	0	0	600	0	400	600	0	0	700	400	200
Total	205,300	22,800	16,000	73,600	17,500	9,200	2,800	0	0	22,600	9,100	31,700

Table 5: Forward-Looking Rental Dynamics Analysis, Row Percentages: 2004–09

Affordability groups	A Total in 2004	B Non- Market in 2009	C Extremely Low Rent in 2009	D Very Low Rent in 2009	E Low Rent in 2009	F Moderate Rent in 2009	G High Rent in 2009	H Very High Rent in 2009	I Extremely High Rent in 2009	J Owner Occupied in 2009	K Seasonal or URE in 2009	L Lost to Stock in 2009
Nonmarket	38,100	19.9%	7.3%	24.5%	6.4%	1.9%	0.5%	0.0%	0.0%	16.2%	1.0%	22.1%
Extremely Low Rent	13,000	19.5%	22.6%	13.0%	2.8%	1.5%	0.0%	0.0%	0.0%	5.7%	13.5%	21.4%
Very Low Rent	74,000	9.9%	9.7%	41.3%	6.1%	3.3%	0.7%	0.0%	0.0%	8.1%	3.4%	17.4%
Low Rent	40,600	8.3%	3.6%	49.9%	9.2%	3.3%	0.9%	0.0%	0.0%	5.0%	7.7%	12.0%
Moderate Rent	26,900	5.9%	6.3%	33.7%	16.6%	8.3%	2.7%	0.0%	0.0%	16.1%	1.3%	9.0%
High Rent	5,900	3.2%	0.0%	22.6%	24.7%	19.4%	0.0%	0.0%	0.0%	24.0%	6.1%	0.0%
Very High Rent	4,000	4.7%	0.0%	18.3%	13.6%	17.3%	9.4%	0.0%	0.0%	28.3%	4.2%	4.1%
Extremely High Rent	2,800	0.0%	0.0%	20.5%	0.0%	12.9%	20.5%	0.0%	0.0%	26.5%	13.7%	6.0%
Total	205,300	11.1%	7.8%	35.9%	8.5%	4.5%	1.4%	0.0%	0.0%	11.0%	4.4%	15.4%

Table 6 compares the rental stock, including vacant rental units, in 2004 and 2009. While there is a slightly higher percentage of nonmarket units in the 2004 rental housing stock, the cumulative percentages are substantially higher at the lower end of the affordable spectrum in 2009.

Table 6: Affordability of Rental Stocks: 2004 vs. 2009

Affordability Categories	2004		2009	
	Units	Cumulative Percent	Units	Cumulative Percent
Nonmarket	38,100	18.6%	31,600	17.8%
Extremely low-rent unit	13,000	24.9%	20,900	29.5%
Very low-rent unit	74,000	60.9%	83,500	76.5%
Low-rent unit	40,600	80.7%	22,600	89.2%
Moderate-rent unit	26,900	93.8%	14,100	97.1%
High-rent unit	5,900	96.7%	4,100	99.4%
Very high-rent unit	4,000	98.6%	700	99.8%
Extremely high-rent unit	2,800	100.0%	300	100.0%
Total	205,300		177,800	

In 2009, 63,500 of the 2004 rental units were no longer rental; 22,600 were owner-occupied; 9,100 were either vacant or being used seasonally; and 31,700 had been lost to the stock. Forward-Looking Table D shows that 42.7 percent of the occupied rental units that were lost were lost because they were severely damaged or destroyed by Hurricane Katrina. Hurricane Katrina probably accounts for an even higher proportion of the vacant rental units that were lost because, as Forward-Looking Table A shows, Hurricane Katrina accounts for a much greater proportion of losses among vacant units overall.

Table 5 shows by affordability category what happened to the rental units in the 2004 housing stock. Overall, 15.4 percent of the rental units were lost by 2009. Loss rates were above average in the three most affordable categories, ranging downward from 22.1 percent for nonmarket units to 17.4 percent for very low-income rentals, and below average for the four least affordable categories.

The percentages of units that became owner-occupied generally showed the opposite pattern. Overall 11.0 percent of 2004 rentals were in the owner stock in 2009; lower than average movement to owner-occupancy occurred among extremely low-rent, very low-rent, and low-rent units, and above average movement to owner-occupancy occurred among moderate-rent, high-rent, very high-rent, and extremely high-rent units. Nonmarket rentals in 2004 were the exception to the general pattern, as 16.2 percent of these units were owner-occupied in 2009.

Table 7: Backward-Looking Rental Dynamics Analysis, Counts: 2009–2004

Affordability groups	<i>A</i> Total in 2009	<i>B</i> Non- Market in 2004	<i>C</i> Extremely Low Rent in 2004	<i>D</i> Very Low Rent in 2004	<i>E</i> Low Rent in 2004	<i>F</i> Moderate Rent in 2004	<i>G</i> High Rent in 2004	<i>H</i> Very High Rent in 2004	<i>I</i> Extremely High Rent in 2004	<i>J</i> Owner Occupied in 2004	<i>K</i> Seasonal or URE in 2004	<i>L</i> New Construc- tion	<i>M</i> Other Additions
Nonmarket	31,600	7,400	2,100	7,300	3,300	1,600	200	200	0	8,000	200	300	900
Extremely Low Rent	20,900	2,700	2,400	6,500	1,400	1,600	0	0	0	4,400	900	0	900
Very Low Rent	83,500	8,900	1,700	29,400	20,000	9,000	1,300	700	600	8,800	1,800	100	1,200
Low Rent	22,600	2,400	400	4,400	3,700	4,400	1,500	600	0	4,100	600	0	700
Moderate Rent	14,100	700	200	2,300	1,300	2,200	1,100	700	400	4,200	900	0	0
High Rent	4,100	200	0	500	400	700	0	400	500	1,100	0	300	0
Very High Rent	700	0	0	0	0	0	0	0	0	700	0	0	0
Extremely High Rent	300	0	0	0	0	0	0	0	0	200	0	0	100
Total	177,800	22,400	6,700	50,400	30,100	19,600	4,100	2,600	1,500	31,600	4,400	700	3,900

Table 8: Backward-Looking Rental Dynamics Analysis, Row Percentages: 2009–2004

Affordability groups	<i>A</i> Total in 2009	<i>B</i> Non- Market in 2004	<i>C</i> Extremely Low Rent in 2004	<i>D</i> Very Low Rent in 2004	<i>E</i> Low Rent in 2004	<i>F</i> Moderate Rent in 2004	<i>G</i> High Rent in 2004	<i>H</i> Very High Rent in 2004	<i>I</i> Extremely High Rent in 2004	<i>J</i> Owner Occupied in 2004	<i>K</i> Seasonal or URE in 2004	<i>L</i> New Construc- tion	<i>M</i> Other Additions
Nonmarket	31,600	23.6%	6.5%	23.1%	10.6%	5.0%	0.6%	0.6%	0.0%	25.5%	0.6%	0.9%	2.9%
Extremely Low Rent	20,900	13.0%	11.4%	31.1%	6.8%	7.7%	0.0%	0.0%	0.0%	21.2%	4.4%	0.0%	4.4%
Very Low Rent	83,500	10.7%	2.0%	35.2%	24.0%	10.7%	1.5%	0.9%	0.7%	10.6%	2.2%	0.2%	1.4%
Low Rent	22,600	10.5%	1.6%	19.3%	16.2%	19.5%	6.6%	2.5%	0.0%	18.1%	2.5%	0.0%	3.2%
Moderate Rent	14,100	5.1%	1.3%	16.7%	9.1%	15.9%	7.9%	5.3%	2.6%	29.8%	6.3%	0.0%	0.0%
High Rent	4,100	4.5%	0.0%	13.3%	8.7%	17.8%	0.0%	9.1%	12.9%	26.6%	0.0%	7.0%	0.0%
Very High Rent	700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Extremely High Rent	300	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.8%	0.0%	0.0%	43.2%
Total	177,800	12.6%	3.7%	28.3%	16.9%	11.0%	2.3%	1.5%	0.8%	17.8%	2.5%	0.4%	2.2%

Table 7 shows there were 177,800 rental units in the New Orleans metropolitan area in 2009, of which almost one-quarter (40,600) were not rental units in 2004. The new rental units came from units that had been owner-occupied (31,600), units that were in seasonal use or used as usual residence elsewhere (URE) (4,400), newly constructed units (700), and other additions (3,900). There was virtually no new construction in the rental sector, and almost half of that was nonmarket.

Table 8 shows by affordability category where the 2009 rental housing stock came from. Because almost half of the 2009 rental stock is very low-rent, that percentage tends to dominate the distribution. Overall, 17.8 percent of the 2009 rental stock was part of the owner stock in 2004, but only the very low-rent category had a below-average rate of movement from the owner stock.

If “recovery” is interpreted as the restoration or replacement of units severely damaged or destroyed by Hurricane Katrina, then the recovery had no impact on the rental housing stock, as Table 3 showed that there were no renter-occupied units among the repaired units.

The improvement in rental market affordability between 2004 and 2009 can be traced to two causes, shifts in supply and demand and changes in the income characteristics of the population. Both causes are strongly linked to Hurricane Katrina. While the rental stock declined by 27,500 units, the rental vacancy rate rose sharply, from 14.4 percent in 2004 to 20.1 percent in 2009, due to the decline in the renter population that accompanied the general decline in population after Hurricane Katrina. In addition, the 2009 population was a higher-income population than the 2004 population. A greater percentage of lower-income households than higher-income households appears to have left the metropolitan area after Hurricane Katrina. As a result, median income rose from \$33,036 in 2004 to \$40,000 in 2009.²⁶ Because the affordability of a rental unit depends upon median income, this increase improves affordability.

Hurricane Katrina and the New Orleans Housing Stock

The New Orleans metropolitan area consists of seven parishes covering 3,153.4 square miles. On August 29, 2005, Hurricane Katrina, a category 3 storm, wrought devastation throughout all seven counties. Published data from the 2004 and 2009 American Housing Surveys of New Orleans provide an excellent overview of how the New Orleans metropolitan area changed from 1 year before Hurricane Katrina to 4 years afterwards. (See Table 9.)

²⁶ This 21.1-percent increase substantially exceeds the 12.3-percent national increase.

Table 9: New Orleans: Pre- and Post-Hurricane Katrina–based on published AHS data

	2004	2009	Change	Percent Change
Population	1,234,900	1,078,500	-156,400	-12.7%
Households	498,200	436,000	-62,200	-12.5%
Housing units	561,000	512,500	-48,500	-8.6%
Rental vacancy rate	14.4%	20.1%	5.7%	
Owner vacancy rate	1.6%	3.0%	1.4%	

In 2004, 1,234,900 people lived in the metropolitan area; in 2009, the population was down to 1,078,500. This population decline was accompanied by a loss of 62,200 households and 48,500 housing units. Since the decline in households was greater than the decline in housing units, the vacancy rates in both the rental sector and owner sector increased.

CINCH analysis allows us to look more deeply, albeit imperfectly, into these changes. Table 10 combines the forward-looking and backward-looking CINCH analyses to track changes from 2004 to 2009. The analysis starts in row 1 with the published AHS estimate of the 2004 New Orleans housing stock and then uses the CINCH estimates of losses, rebuilding, and additions to derive an estimate of the 2009 New Orleans housing stock in row 8. Row 9 contains the published AHS estimate, and row 10 shows that CINCH underestimated the losses and overestimated the additions by a combined 9,700 units, or 20.0 percent of the overall change.

Table 10: CINCH Analysis of Changes in the New Orleans Housing Stock: 2004–09

1	2004 housing stock (published AHS estimate)	561,000		Breakdown of other losses	
2	Severely damaged or destroyed by Hurricane Katrina	40,400	a	Loss by 2009 due to conversion or merger	2,200
3	Other losses	37,800	b	Loss by 2009 due to nonresidential use	2,200
			c	Loss by 2009 due to demolition or disaster not related to Katrina	2,400
			d	Loss by 2009 due to damage or condemnation not related to Katrina	1,600
			e	Loss by 2009 due to other causes	29,400
					37,800
4	2004 stock rebuilt after Hurricane Katrina	4,700		Breakdown of other additions	
5	Additions severely damaged or destroyed by Hurricane Katrina and rebuilt	3,000	f	Added by conversion or merger	1,300
6	New construction – not affected by Hurricane Katrina	18,600	g	Added by house or mobile home move in	1,700
7	Other additions – not affected by Hurricane Katrina	13,100	h	Added from nonresidential use	3,200
8	CINCH estimate of 2009 stock	522,200	i	Added from temporary loss	3,000
9	2009 housing stock (published AHS estimate)	512,500	j	Added in other ways	3,900
10	Amount losses are underestimated and rebuilding and additions are overestimated	9,700			13,100
11	As percent of change	20.0%			

Using the AHS sample, CINCH estimates that Hurricane Katrina severely damaged or destroyed 40,400 housing units. An additional 37,800 units were lost in other ways between 2004 and 2009. It would be incorrect to label these 37,800 units as losses “unrelated” to Hurricane Katrina. The New Orleans metropolitan housing market had a high rental vacancy rate in 2004, and the subsequent loss of 62,200 households further weakened the market. Losses from other causes were undoubtedly accelerated by the decline in the population of New Orleans resulting from Hurricane Katrina.

The right-hand side of Table 10 provides information on how the non-Hurricane Katrina losses occurred. Unfortunately, the AHS data on type of loss suffer from two deficiencies, a puzzling failure to identify any mobile homes that were moved off of their lots and an overwhelming majority of losses (77.8 percent) classified as due to “other causes.”

Table 2 showed that the percentage of units lost from all causes was significantly higher for units that were vacant in 2004 than for the overall stock (19.4 percent vs. 12.4 percent) and that the loss rate varied significantly by tenure, 15.1 percent for renter-occupied units and 9.4 percent for owner-occupied units. Among rental units the loss rates were highest among the lowest-rent units and units with no cash rent and among units renting to the lowest-income households. While the same patterns are seen among units severely damaged or destroyed by Hurricane Katrina, the Hurricane Katrina rates for these groups are generally not statistically significantly different from the overall Hurricane Katrina rate.

Losses from all causes were also particularly high among small units, those with fewer than five rooms or fewer than three bedrooms. The same pattern applies to Hurricane Katrina losses but with fewer instances where the rates are statistically different from the overall rate.

Rebuilding units damaged by Hurricane Katrina contributed little to the 2009 New Orleans housing stock. Only 4,700 of the 40,400 units severely damaged or destroyed by Hurricane Katrina were rebuilt by 2009.²⁷ Another 34,700 units were added to the New Orleans housing stock between 2004 and 2009. Of these, 18,600 were newly constructed; 13,100 were added by means other than new construction; and 3,000 were units added after the 2004 survey that were subsequently severely damaged or destroyed by Hurricane Katrina and then rebuilt by 2009. At the national level, new construction typically accounts for approximately 70 percent of all additions. However, the national percentage fell to 52 percent in the weak housing market of the 2007 to 2009 period. New construction accounted for 58.7 percent of additions in New Orleans.²⁸

The right side of Table 10 provides more information on additions other than new construction. There were 1,300 units added through the merging or splitting of existing units; 1,700 units added by the moving in of mobile homes or houses; 3,200 units added by converting nonresidential structures to residential use; 3,000 units added by recovering units that had serious

²⁷ We used the backward-looking estimate for 2004 units rebuilt because it produces a smaller overestimate of the 2009 housing stock.

²⁸ This percentage is based on Table 10, rows 6 and 7 only; row 5 contains both newly constructed units and units added by other means.

structural deficiencies or had been condemned in 2004; and 3,900 units added in unspecified ways.

The data in Table 3 showed that mobile homes constituted 11.9 percent of the units that were added or rebuilt while comprising only 4.0 percent of the overall stock. The rate of new construction was significantly lower among smaller units—those with four or fewer rooms or two or fewer bedrooms—and among renter-occupied units. Additions by means other than new construction were statistically more common among the smaller units.

Rebuilding was most common in owner-occupied units with housing costs between \$350 and \$799 per month and those occupied by households earning less than \$15,000 annually.

The rental dynamics analysis shows that rental housing was more affordable in 2009 than in 2004. While there were 27,500 fewer rental units in 2009, the rental vacancy rate was 5.7 percentage points higher. The share of the rental stock affordable to households earning 50 percent or less of area median income was 76.5 percent in 2009, compared to 60.9 percent in 2004.

Appendix A: Internal and External Checks

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

- For each row, we tested whether the sum of possible outcomes (columns D through N) equaled the number of units present in the base year (column C). In every case, exact equality was achieved prior to rounding.
- Throughout the tables, various sets of rows are related to each other. For example, the year-built rows (13–26) in Table A are a disaggregation of the total stock in row 1. Similarly, rows 7, 10, and 13–16 in Table C are a disaggregation of row 1 (occupied households). In these cases, there should be equality between the parent row and the sum of the breakout rows for all columns except D, E, F, and G. The difference between column D in the parent row and the sum of column D for the breakout rows should equal the negative of the difference between column E in the parent row and the sum of column E for the breakout rows. The same for columns F and G. In every case, exact equality was achieved prior to rounding.

Column B provides an external check of how well the CINCH weighting performed.