

## **Methodology for State and County Total Housing Unit Estimates (Vintage 2014): April 1, 2010 to July 1, 2014**

### **OVERVIEW**

The U.S. Census Bureau estimates the number of housing units for each year since the most recent decennial census. With each annual release of housing unit estimates, the entire time series of estimates beginning with April 1, 2010 is revised and updated. The estimates use building permits, estimates of non-permitted construction, mobile home shipments, and estimates of housing loss to estimate change in the housing stock. These component data come from various Census Bureau surveys.

We produce housing unit estimates for all states and counties annually. We release these estimates to the public, and they are used as controls for several Census Bureau surveys, including the American Community Survey (ACS), the American Housing Survey (AHS), and the Current Population Survey (CPS). In addition to state and county housing unit estimates, we also produce subcounty housing unit estimates. These estimates are central to the production of population estimates for cities and towns across the nation.

### **METHOD**

We produce housing unit estimates using the components of housing change. In this model, we add together the 2010 Census count of housing units, estimated new residential construction, and estimated new mobile homes. From this sum we subtract the estimated housing units lost. The computation of annual July 1 housing unit estimates is expressed by the following formula:



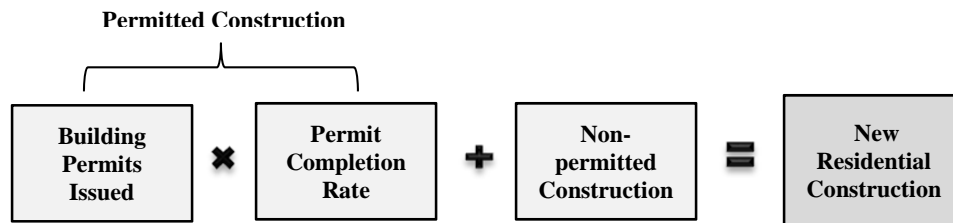
After these data are combined to produce a preliminary set of housing estimates, they are reviewed by members of the Federal-State Cooperative for Population Estimates (FSCPE) and by local jurisdictions. The final housing estimates may reflect updates from their review of the estimates. Each component of the housing unit change model is described below.

### **2010 Census Housing Units**

Every year, we retabulate the 2010 Census counts of housing units in current legal geographic boundaries to form the base for the annual housing unit estimates. The base for the housing estimates reflects annual geographic boundary updates from the Boundary and Annexation Survey (BAS) that are legally effective as of January 1. The base also includes the results of completed Count Question Resolution (CQR) actions and geographic program revisions incorporated into the Master Address File (MAF)/TIGER Database through May of each estimate's year.

## New Residential Construction

Residential construction is the largest component of housing change. We estimate new residential construction in two parts: permitted construction and non-permitted construction. The calculation of new residential construction is represented by the following formula:



### *Permitted Construction*

According to the Census Bureau, more than 98 percent of all new housing units are erected in places that issue building permits. We calculate estimates of new permitted construction by multiplying the number of residential building permits issued by a permit completion rate. Data on issued permits come from the Building Permits Survey (BPS).<sup>1</sup> This survey includes reported permits from approximately 20,000 jurisdictions. These data are reported to the BPS by calendar year for cities and towns across the country. Implicit in the method of using calendar year permits is an assumption of a six-month lag time between when a building permit is issued and when the housing unit is completed. Thus, permits that are issued in the first six months of a particular calendar year are not processed in the housing unit estimates until the following year. For example, the July 1, 2014 housing unit estimates are based on permits issued between January 1, 2013 and December 31, 2013. Permits issued between January 1, 2014 and December 31, 2014 will be processed in the 2015 housing unit estimates.

The permit completion rates used to calculate new permitted construction are based on national estimates of permits that are either abandoned or deemed “out of scope” by the Survey of Construction (SOC).<sup>2,3</sup> We update the completion rate every year, as new survey data become available. The 2014 permit completion rate reflects the percent of building permits issued in calendar year 2013 that resulted in completed housing units.

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<sup>1</sup> The Census Bureau conducts the BPS. For more information about this survey, see <http://www.census.gov/construction/bps/>.

<sup>2</sup> Abandoned permits are permits that the survey respondent or building permit office has indicated that construction of the housing unit(s) authorized by that permit will not be completed using that permit. Out of scope permits are those that were reported as permits for new, privately-owned housing units by the building permit office, but it was later determined that the units did not meet the definition of new privately-owned housing units (e.g., the units were intended as group quarters, for commercial use, etc.).

<sup>3</sup> The Census Bureau conducts the SOC. For more information about this survey, see <http://www.census.gov/econ/overview/co0400.html>.

### *Non-permitted Construction*

We calculate estimates of new non-permitted construction using data on new residential housing units constructed in places that do not issue building permits. These data also come from the SOC. The estimates of non-permitted construction are regional-level data that we distribute to all places that do not receive building permits, based on each place's share of the region's total housing units enumerated in the 2010 Census. For example, if a place contained 5 percent of the region's housing units as of the 2010 Census, and does not issue building permits, we distribute 5 percent of the region's non-permitted units in the SOC to that place. There is no lag time applied to the estimates of non-permitted construction. The sampling frame for the SOC does not include any non-permitting areas in the West; therefore, we do not distribute non-permitted housing units to places in that region.

### **New Mobile Homes**

The data we use to create estimates of new mobile homes come from the Manufactured Homes Survey (MHS).<sup>4</sup> We calculate annual mobile home estimates by compiling monthly state shipment data from July of the previous year through June of the current year. For example, the July 1, 2014 mobile home estimates are based on mobile home shipment data from July 1, 2013 through June 30, 2014. We distribute the state-level mobile home estimates to each place within the state based on each place's share of the state's total mobile homes. To do so, we use information from the Census 2000 long form on "type of structure" for housing units.

### **Housing Unit Loss**

We calculate housing unit loss by applying an annual loss rate to the housing stock. The 2014 estimates of housing units lost are based on national-level data from the 2009 and 2011 American Housing Survey (AHS).<sup>5</sup> The following three types of housing situations in the AHS represent permanent loss of a housing unit:

- Type B, 16 – Interior exposed to the elements
- Type C, 30 – Demolished
- Type C, 31 – House or mobile home moved

Under our current method, a housing unit is lost if it existed at the time of the 2009 survey, but fell into one of the three loss categories identified above in the 2011 survey. The housing loss rates vary by type and age of structure, which are obtained from Census 2000 long form data. Housing units fall under one of three types: houses (including apartments and flats), mobile homes, or other types of housing units. Loss rates for houses also vary by the decade in which they were built. The 2014 housing loss rates are as follows:

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<sup>4</sup> The Census Bureau conducts the MHS. For more information about this survey, see [http://www.census.gov/construction/mhs/about\\_the\\_survey.html](http://www.census.gov/construction/mhs/about_the_survey.html).

<sup>5</sup> The Census Bureau conducts the AHS. For more information about this survey, see <http://www.census.gov/programs-surveys/ahs/>.

<i>Type and Age of Structure</i>	<i>Loss Rate (percent)</i>
House, Apartment, or Flat built in:	
1990 - 1999	0.03
1980 - 1989	0.06
1970 - 1979	0.17
1960 - 1969	0.16
1950 - 1959	0.19
1940 - 1949	0.38
Pre 1940	0.42
Mobile Homes	1.76
Other Housing Units <sup>6</sup>	0.34

Our method assumes that newer housing units are the least at risk of being lost. Therefore, housing units built after 2000 have no loss. After we calculate an estimate of housing loss for the nation by age and type of structure, we distribute those estimates to each place and minor civil division in the country, based on the characteristics of each area's housing stock.

### **July 1, 2010 Housing Unit Estimates**

We use one quarter of the 2010 permitted and non-permitted construction, mobile homes, and housing loss to produce the July 1, 2010 estimates. This represents the change in housing stock during the three month period from April 1, 2010 to July 1, 2010.

### **REVIEW OF PRELIMINARY ESTIMATES**

The preliminary housing unit estimates are distributed for review to members of the FSCPE. Some FSCPE members provide revisions to the estimates, in the form of alternative housing component data, based on information they compile from the jurisdictions within their respective states. Alternative housing component data include local building permits, mobile home placements, demolitions, and housing completions derived from non-permitted construction, certificates of occupancy and housing conversions. We review submissions from FSCPE members, and those that are accepted replace the original housing component data for those jurisdictions.

### **ESTIMATES CHALLENGE REVISIONS**

Localities that challenge the Census Bureau's subcounty population estimates have the option of revising the housing component data specific to their area.<sup>7</sup> These revisions are included in the final housing unit estimates.

<sup>6</sup> "Other Housing Units" include boats, recreational vehicles, and other types of housing arrangements.

<sup>7</sup> For a list of accepted subcounty population challenges, see <http://www.census.gov/popest/data/challenge/results.html>