Methodology

Methodology for State and County Total Housing Unit Estimates (Vintage 2008): April 1, 2000 to July 1, 2008

NOTE: These estimates include adjustments due to the effects of hurricanes Katrina and Rita. For a description of these adjustments, refer to Special Processing Procedures for the Areas Affected by Hurricanes Katrina and Rita at: http://www.census.gov/popest/topics/methodology/.

The U.S. Census Bureau produces July 1 estimates of housing units for states and counties on an annual basis. These estimates are released to the public and are used as controls for some of the Census Bureau's surveys, such as the American Community Survey (ACS) and the American Housing Survey (AHS). We develop housing unit estimates for subcounty areas, our lowest level of geography – the state and county housing unit estimates are aggregations of these housing unit estimates. We then produce subcounty population estimates by a housing unit method using intra-county housing unit distributions to distribute county population to subcounty areas.

Overview

Housing unit estimates use building permits, estimates of non-permitted construction, mobile home shipments, and estimates of housing unit loss to update housing unit change since the last census. Census counts of housing units are re-tabulated in current legal boundaries to form the housing base for the estimates.

Method

We produce updated housing unit estimates for each area using a component model of change. In this model we add together the Census 2000 count of housing units, estimated new residential construction (from April 1, 2000 to December 31, 2007), and estimated new residential mobile home placements (from April 1, 2000 to July 1, 2008). From this number we subtract the estimated residential housing loss from April 1, 2000 to July 1, 2008. We combine these data to produce a set of preliminary housing estimates. The final housing estimates may reflect updates from the Federal-State Cooperative for Population Estimates (FSCPE) member agencies and local jurisdictions. Each component in the housing estimates is described below.

Census 2000 Housing Units

Census 2000 housing units compiled at the subcounty level reflect boundary updates that are legally effective as of January 1, 2008. The housing units also include the results of any Count Question Resolution (CQR) actions and geographic program revisions benchmarked in the Master Address File (MAF)/TIGER Database through May of 2008.

Estimated Residential Construction

Residential construction is by far the largest component in the residential housing estimates component model. We estimate new residential construction in two parts: estimates of permitted and non-permitted construction.

Permitted Construction

Building permits cover approximately 98 percent annually of the new housing units nationwide and include data from approximately 20,000 jurisdictions. The Census Bureau's Manufacturing and Construction Division (MCD) compiles the building permit data through its annual Building Permit Survey. The survey data provide the number of residential building permits reported in calendar years. We aggregate these data for all years from 2000 through 2007. Implicit in this method of selecting and applying permits for whole calendar years is an assumption of an average six-month lag time between when a residential permit is issued and when the residence is completed. Thus, permits that are reported in the first six months of the calendar year for which the midyear housing estimates are being prepared are excluded in the current year estimates and included in the following year estimates. This method assumes that the building permits are allocated to the appropriate midyear estimate.[1]

We reduce the permitted annual calendar year construction data by 2.0 percent to estimate the number of completed new units. Reports from other census studies indicate that, on average, two percent of all building permits never result in the construction of a housing unit. This approach is applied uniformly across the United States.

Non-Permitted Construction

We compile estimates for areas of non-permitted residential construction based upon the annual Survey of Construction (SOC) conducted by MCD. The survey produces regional estimates of housing units constructed and ready for occupancy in non-permit issuing jurisdictions. No lag time is applied to these estimates. Within each region, we

distribute each year's regional SOC estimate to the jurisdictions that did not report to MCD on permits issued for the corresponding calendar year. We base the distribution of the regional non-permitted construction to non-reporting jurisdictions based upon its share of the regional total of housing units enumerated as of Census 2000.

Combined Permitted and Non-Permitted Construction

Finally, we combine the estimates of non-permitted construction with the estimates of permitted construction to produce an aggregate set of estimated new residential construction. These units are available for occupancy between April 1, 2000 and July 1, 2008 for all jurisdictions nationwide.

Estimated New Mobile Home Placements

The Census Bureau does not have updated mobile home placement data directly applicable at the subcounty level. However, we do acquire mobile home shipment data by state on a monthly basis from MCD. We sum these monthly reports to calculate a July through June total of state mobile home shipments. We then allocate the updated state mobile home shipment data to subcounty jurisdictions based on their share of state mobile homes estimated from Census 2000 sample data. We used the Type of Structure question on the sample questionnaire in Census 2000 to derive an estimate of residences that were mobile homes.[2]

Estimated Housing Loss

Housing unit loss is calculated by applying an annual rate of loss to the previous year's housing unit estimate. The 2008 estimates of housing unit loss are based on data derived from the 1997-2003 American Housing Survey (AHS) national sample. These data are also for the July to June period each year. The following three types of AHS housing situations are considered to represent permanent loss of a housing unit.

Type B, 16 -- Interior exposed to the elements
Type C, 30 -- Demolished or disaster loss
Type C, 31 -- House or Mobile Home moved

Annual housing unit loss rates based on these types of housing loss are then developed for housing units based on structure type and age of structure. Type C, 31 houses were excluded before the final rate was computed. The rates for the categories are as follows:

Category:	Rate:
House, Apartment, or Flat built in:	
1990-1997:	0.031 percent
1980-1989:	0.054 percent
1970-1979:	0.103 percent
1960-1969:	0.172 percent
1950-1959:	0.249 percent
1940-1949:	0.324 percent
Pre-1940:	0.364 percent
Mobile Homes:	1.58 percent
Other:	0.19 percent
Overall loss rate:	0.295 percent

The type and age of housing units in Census 2000 for each jurisdiction are used to estimate its housing unit loss. The "Other" housing category includes a variety of situations not defined above, including boats, recreational vehicles, or other housing arrangements.

July 1, 2000 Estimates

We use ¼ of the 2000 permitted and non-permitted construction, mobile home placements, and housing loss to produce July 1, 2000 estimates. We assume these components adequately represent the amount of change in housing stock during the three-month period from April 1, 2000 to July 1, 2000.

Estimates Review

The housing unit estimates are produced in preliminary form and distributed to members of the FSCPE for review. Some FSCPE members provide revisions to the preliminary estimates of housing units based on information they compile from the jurisdictions within their respective states. Submitted revisions to the housing unit estimates are reviewed and result in improvements to the final housing unit estimates.

Estimates for Subcounty Population Estimates Production

The housing unit estimates with revisions are summed to obtain subcounty and county housing unit totals. These estimates are then complete for use in preparing the subcounty population estimates.

Incorporation of Final Housing Unit Estimate Revisions

Localities that challenge the Census Bureau's population estimates have an option of using components of housing change data (residential, building permits, mobile homes, and demolitions) specific to their area. The revised housing component data used to support a revised population estimate are included in the final housing unit estimates.

Preparation of the Final State and County Housing Unit Estimates

The final housing unit estimates are summed to the county, state, and national levels. This final set of estimates is complete for use as controls in selected Census Bureau surveys and for public dissemination.

---

[1] The basis for this approach is documented in http://www.census.gov/const/avg_starttocomp.pdf.

[2] The following steps describe the process we use to produce sample data consistent with the 100-percent housing unit data in current geography:

A. Each unit in the Sample Edited Detail File (SEDF) is matched to the geographically updated 100-percent Detail File (HDF) extract, by unit identification number.
B. The updated geographic codes from the HDF (higher level, census tract, and block) are applied to the SEDF records.
C. The sample data are re-tabulated with the sample weights for the primitive geographic areas into which they belong after the geographic update. (Note: *Primitive* geography describes a partition of the country into the lowest level of mutually exclusive entities that can be aggregated to all higher levels of geography for which the Census Bureau produces estimates.)
D. The sample data tallies in each primitive geographic area are multiplied by the ratio of housing units in the tabulation Census 2000 HDF to the housing units in the tabulation Census 2000 SEDF.
E. The results are aggregated to all estimates geography summary levels.