

Methodology for State and County Total Housing Unit Estimates (Vintage 2007):
April 1, 2000 to July 1, 2007

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/>.

BACKGROUND

The U.S. Census Bureau produces 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 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.

METHODOLOGY

Housing unit estimates use building permits, mobile home shipments, and estimates of housing unit loss to update housing unit change since the last census. Census counts of housing units are retabulated in current vintage geography.

We produce housing unit estimates for each area by the component model described below. The July 1, 2007 estimates are used here as an example.

$$HU_{07} = HU_{00} + NC_{07} + NM_{07} - HL_{07}$$

Where:

HU_{07} = Estimated 2007 housing units

HU_{00} = Census 2000 housing units retabulated to current geography

NC_{07} = Estimated new residential construction, April 1, 2000 to July 1, 2007

NM_{07} = Estimated new residential mobile home placements, April 1, 2000 to July 1, 2007

HL_{07} = Estimated residential housing loss, April 1, 2000 to July 1, 2007

- A. Census 2000 Housing Units (HU_{00}) -- Census 2000 housing units at the subcounty level reflect boundary updates that are legally effective as of January 1, 2007. The housing unit counts also include Count Question Resolution (CQR) actions and geographic program revisions benchmarked in the Master Address File (MAF)/TIGER Database through May of 2007.
- B. Estimated Residential Construction (NC_{07}) --New residential construction is calculated using the following formula:

$$NC_{07} = (BP_{07} * 0.98) + NPC_{07}$$

Where:

NC_{07} = Estimate of new residential construction for the period: April 1, 2000 to July 1, 2007

BP_{07} = The residential building permits that result in the construction of new units for the period April 1, 2000 to July 1, 2007 include permits issued in calendar years 2000–2006 (allowing for a six-month lag time between permit issuance and completed construction).

NPC_{07} = Estimate of new residential construction in non-permit issuing areas for the period: April 1, 2000 to July 1, 2007

Note: We assume that using $\frac{1}{4}$ of the residential construction input data for the year 2000 represents the three-month period from April 1, 2000 to July 1, 2000.

Building permit data are compiled from internal data files developed by the Census Bureau's Manufacturing and Construction Division (MCD). These files include imputed permits where a jurisdiction did not report permit issuance for the entire year.

Two percent of all building permits never result in the actual construction of a housing unit (as derived from U.S. Census statistics on housing starts and completions; available on the Census Bureau website at <http://www.census.gov/const/www/newresconstindex.html>).

Therefore, a factor of 0.98 is used to estimate completed new units.

The annual Survey of Construction (SOC) produces regional estimates of housing units constructed in non-permit issuing jurisdictions. The regional SOC estimates are then distributed to all subcounty areas where MCD lacks building permits for the estimates period. This distribution is based on the subcounty area's share of the regional total of units in nonpermit-issuing jurisdictions as of Census 2000.

- C. Estimated New Mobile Home Placements (NM_{07}) --The Census Bureau lacks updated data at the subcounty level on mobile home placements. We derive estimates for mobile homes by allocating state mobile home shipment data to subcounty areas based on their area's share of state mobile homes in Census 2000.

We receive monthly reports on mobile home shipments from MCD. These monthly reports are summed to calculate the annual total of state mobile home shipments.

To allocate the state mobile home shipment data to subcounty areas, we apply the subcounty area's share of state mobile homes as of Census 2000 to the updated number of state mobile home shipments. The type of structure question indicating that a housing unit is a mobile home was on the sample questionnaire in Census 2000. The following steps describe the process we use to produce sample data consistent with the 100-percent housing unit data in current geography:

1. 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.
 2. The updated geographic codes from the HDF (higher level, census tract, and block) are applied to the SEDF records.
 3. The sample data are retabulated with the sample weights for the primitive geographic areas into which they belong after the geographic update.¹
 4. 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.
 5. The results are aggregated to all estimates geography summary levels.
- D. Estimated Housing Loss (HL₀₇) -- Housing unit loss is calculated by applying an annual rate of loss to the previous year's housing unit estimate. The 2007 estimates of housing unit loss are based on data derived from the 1997–2003 American Housing Survey (AHS) national sample. 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 were 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:

<u>Category:</u>	<u>Rate:</u>
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 governmental unit are used to estimate its housing unit loss. Other housing includes a variety of situations not defined above, including boats, recreational vehicles, or other housing arrangements.

- E. Estimates Review –The housing unit estimates are distributed to members of the Federal State Cooperative Program for Population Estimates (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 often result in changes to the final housing unit estimates.
- F. Estimates for Subcounty Population Estimates Production – The housing unit estimates in primitive geography with revisions are summed to obtain subcounty and county housing unit totals. These are summed to produce state and national level housing unit estimates. These estimates are then ready for use in preparing subcounty population estimates.
- G. Incorporating Final Housing Unit Estimate Revisions – Localities who disagree with the Census Bureau’s estimates can challenge their population estimates. They have the option of using components of housing change data (residential, building permits, mobile homes, and demolitions) specific to their area. The data are used to prepare a revised housing unit estimate and a population estimate. We incorporate these housing unit estimates into our final housing unit estimates at the primitive geography level.
- H. Final State and County Housing Unit Estimates – The final housing unit estimates in primitive geography are summed to subcounty and county housing unit totals. These are summed to produce state and national level housing unit estimates. These estimates are prepared for use as controls in selected Census Bureau surveys and for public dissemination.

¹ *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.