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Special Attention of:

## **NOTICE** PDR-2007-01

Regional Directors, Field Office Directors,  
Economists, Public & Indian Housing  
Division Directors, Multifamily Hub Directors,  
Multifamily Program Center Directors

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Cross References:

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**Subject:** Estimated Median Family Incomes for Fiscal Year 2007

This memorandum transmits median family income and income distribution estimates for Fiscal Year (FY) 2007. They are calculated for each metropolitan and nonmetropolitan area using the Fair Market Rent (FMR) area definitions applied in the Section 8 Housing Choice Voucher Program. The estimated median family income for the United States for FY2007 is \$59,000.

This year's estimates are the first to be able to take advantage of the first full Census American Community Survey (ACS) sample sizes collected in 2005. While HUD's FY2007 median family income estimates are still updates of 2000 Census data, the 2007 HUD update factors differ from FY2006 update factors in two very important ways:

- FY2007 estimates are based on local area ACS 2005 surveys for places of 65,000 or more, where such surveys have been published.
- Estimates for all other areas now reflect the state-level change between the 2000 Census state and 2005 ACS state estimates, rather than being based on applying ACS changes (e.g., 2000-2004 for FY2006 estimates) to 2000 Census estimates.

HUD's FY2007 MFI estimates make more extensive use of ACS data than previously, although local Bureau of Labor Statistics wage data continue to be used to influence estimates for areas of less than 65,000. All estimates are projected forward from 2005 to April 1, 2007, using an annual trend factor of 3.5 percent. Except for minor modifications, HUD continues to use the same area definitions used in FY2006.



## ATTACHMENT 1

### HUD METHODOLOGY FOR ESTIMATING FY2007 MEDIAN FAMILY INCOMES (ECONOMIC AND MARKET ANALYSIS DIVISION, OFFICE OF ECONOMIC AFFAIRS, PD&R)

FY2007 HUD estimates of median family income are based on 2000 Census median family income (MFI) estimates updated with county-level Bureau of Labor Statistics (BLS) earnings data and Census American Community Survey (ACS) state-level MFI estimates or ACS local area MFI estimates. Separate HUD MFI estimates are calculated for all Metropolitan Statistical Areas (MSAs), and nonmetropolitan counties.

FY2007 HUD MFI estimates reflect, for the first time, results from the fully implemented ACS, which was conducted in 2005. The manner in which the ACS data are used depends on the type of data available, which differs by place size. Local ACS MFI estimates are available for areas with populations of 65,000 or more, but the statistical reliability of these estimates differs. When local MFI estimates are available, HUD MFI estimates are based partly on local ACS estimates and partly on state-level ACS estimates. The higher the statistical reliability of local estimates, the more heavily they are used. Local ACS MFI estimates are used in inverse proportion to the size of their margins of error (MoEs)<sup>1</sup>. In practice, estimates for areas with small MoEs are almost entirely based on local ACS estimates but, where MoEs are large, state-level estimates more heavily influence results. For areas without local ACS estimates, update factors are generated using a combination of state-level 2000 Census to 2005 ACS MFI change and local area BLS wage change data. All estimates are then updated from 2005 to April 1, 2007 using an annual trend factor of 3.5 percent, which reflects the average annual change in median income from 1990 to 2000.

#### **Areas of 65,000 or more**

While the ACS provides the best data on local median incomes in areas of 65,000 or more population<sup>2</sup> since the 2000 Census, ACS estimates differ from those of the 2000 Census in significant ways. Annual ACS estimates of MFI do not have the same reliability as the decennial Census estimates. This is primarily due to the fact that the annual ACS survey sample is about one-fifth the size of the decennial census “long-form” sample, which results in larger estimated MoEs for the ACS surveys. MoEs around 2000 Census medians for metropolitan areas range from 0.3 percent to 9 percent and average 1.5 percent. Ninety-one percent of 2000 Census metropolitan areas have a MoE of 2.5 percent or less. MoEs around ACS MFI estimates for metropolitan areas range from 0.7 percent to just under 20 percent, and average 6.4 percent. Less than 10 percent of the ACS MFI estimates have MoEs of less than 2.5 percent. One-year ACS survey results, even for the largest areas, are inherently less reliable than 2000 Census results.

ACS estimates are also significantly lower than 2000 Census estimates when each is inflated to the

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<sup>1</sup> The numbers computed by adding and subtracting the published margin of error from the median family income estimate form the “90 percent confidence interval” for the estimate. There is a 90 percent probability that any random sample of the same size from the population will yield an estimate of the median family income in this range.

<sup>2</sup> These areas include most MSAs and HUD Metro FMR Areas as well as some large nonmetropolitan counties -- 563 total areas.

same point in time. In a paper prepared for the American Statistical Association, Census staff members Nelson, Welniak, and Posey posit several theories as to why the ACS MFI estimates are statistically lower than those measured by the 2000 Census.<sup>3</sup> Two of the more significant causes are believed to be differences in the survey questions and data collection processes used in the two survey instruments. As stated in their paper, “the biggest difference between collection methods in the ACS and the decennial Census is the income reference period.” Nelson, et al., provide an in-depth discussion of the differences between 2000 Census questions asking for income information from a fixed point in time (“during 1999” – the last calendar year before the Census) and the ACS, which asks for income for “the past 12 months” during the data collection period. The primary difference here was found to be in reporting of “wage and salary” income, the largest income component for the vast majority of households, where “the past twelve months” questions yielded lower reported incomes than “in the previous calendar year” questions covering the same period.

In addition, several other data collection and survey processing differences are noted in the paper. The 2000 Census used Optical Character Recognition (OCR) methods to capture hand-written responses while the ACS employs “keyers” to record hand-written responses. Nelson, et al., assert that “we know that OCR produces higher income amounts than having actual ‘keyers’ record the data.” Furthermore, the ACS “used computer-assisted telephone interviewing (CATI) and computer-assisted personal interviewing (CAPI)” in cases where households failed to respond via mail, whereas the 1990 Census did not. Lastly, the allocation methods used to augment survey information for incomplete responses are different between the ACS and the 2000 Census. This is caused by the fact that even the full 2005 ACS had a much smaller sample than the 2000 Census – about 3 million housing units for a full year of data for the ACS compared to around 17 million during the Census. Any, or all, of these differences may contribute to the lower measurements of income derived from the ACS.

Because the transition to ACS-based MFI estimates will frequently include downward adjustments in estimates, and one-year ACS survey estimates of MFIs have significantly larger MoEs than decennial Census estimates of MFIs, HUD is implementing ACS survey results with some caution. HUD’s objective is to minimize the possibility of publishing income estimates with annual changes driven more by survey error than changes in underlying economic conditions. HUD therefore developed a formula for incorporating 2005 ACS local median income estimates into its FY2007 MFI estimates that explicitly considers the margin of error (MoE) in the local ACS results. The formula gives low weight to ACS local median income estimates with large MoEs, thereby limiting the influence of the local ACS estimates in these areas on the HUD MFI estimates. Conversely, the formula gives high weights to ACS local median income estimates with small MoEs, allowing the ACS estimate to be the dominant component of the HUD estimate in these areas.

Put simply, the formula produces a multiplicative update factor for the 1999 MFI reported in the 2000 Census. The factor is a weighted average of (a) the change in local area MFI from 1999 (2000 Census) to 2005 (local 2005 ACS), and (b) the change in state MFI from 1999 (state 2000 Census estimates) to 2005 (state 2005 ACS estimates). The weight assigned to the change in state MFI (b) is five times the local “margin of error ratio” (MoER), or one, whichever is smaller. The MoER is defined as the margin of error of the 2005 ACS local estimate divided by the 2005 ACS estimate of local MFI. The weight assigned to the change in local median family income from the ACS (a) is

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<sup>3</sup> Charles Nelson, Edward Welniak, Kirby G. Posey, Income in the American Community Survey: Comparisons to Census 2000, American Statistical Association, August 2006

the larger of 1 minus 5 times the MoER or zero<sup>4</sup>.

When multiplied by the 1999 MFI reported in the 2000 Census, the weighted average factor defined above produces a FY2005 MFI estimate equivalent to the ACS survey estimate. This estimate is then trended forward from FY2005 (December 2005) to FY2007 (April 2007) by multiplying it by the national average annual income growth factor.

The step-by-step procedures used to develop FY2007 estimates for areas of 65,000 plus are as follows:

1. The 2000 Census was used to estimate what are treated as mid-1999 local median family income estimates<sup>5</sup>.
2. The 2000 Census estimates are updated from mid-1999 to end-2005 using the following formula:

$$(1 - 5 * \text{margin of error}) * (\text{ACS2005 local median}^6 / \text{Census 2000 local median}) + (5 * \text{margin of error}) * (\text{ACS2005 state median} / \text{Census 2000 state median})$$

3. Median family income estimates for April 1, 2007, are then estimated as follows:

$$\begin{aligned} & \text{Step 1 median family income} \\ & * \text{Step 2 adjusted local update factor} \\ & * 1.035 \text{ (3.5\% annual trending)}^{1.25 \text{ years}}^7 \\ & = \text{FY 2007 Median Family Income estimate} \end{aligned}$$

### **Areas of less than 65,000**

The income adjustment factors used to update the 2000 Census-based estimates of Median Family Incomes for areas of less than 65,000<sup>8</sup> are developed in several steps. Census and ACS survey data

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<sup>4</sup> Because the largest MoER in the FY2005 ACS local data is approximately 0.2, the factor of 5 ensures that the local ACS estimates with the largest MoERs exert almost no influence on the FY2007 MFI estimates. In cases where HUD's special tabulations of MFIs have MoERs larger than in Census-published areas, HUD effectively excludes their use by capping the value of 5 times MoER at 1.

<sup>5</sup> Estimates of income need to be associated with a point in time. This poses the need to attribute an "as of" date to estimates when such dates are not explicitly defined. The 2000 Census income data, for instance, are based on questions regarding total income for 1999. For most households, income for a year is based on an income stream with at least some changes during the year. For purposes of estimation, HUD assumes that the 2000 Census income estimates have an "as of" date of mid-1999.

<sup>6</sup> ACS estimates are based on samples drawn throughout the survey year that ask about income for the previous 12 months, thereby reflecting income over a 24 month period. All responses are then adjusted by the Bureau of the Census to "annual" 2005 values using the CPI index for the month of the survey over the annual CPI index for the year. See "Income, Earnings, and Poverty from the 2005 American Community Survey", August 2005 page 2 for a discussion of inflation adjustments made by Census for the ACS. HUD makes a further adjustment to these values by moving the "as of" date to December of the survey year, again using CPI indexes. Specifically, HUD adjusts the annual 2005 estimate to December using the seasonally adjusted December 2005 CPI (197.7) over the 2005 annual CPI (195.3). All 2005 ACS and BLS data are adjusted to December of 2005 in this way.

<sup>7</sup> The caret symbol (^) means applying the exponent 1.25, commonly phrased "raised to the power".

<sup>8</sup> These include most nonmetro counties and a few small MSAs and small HUD Metro FMR Areas -- 2,012 total areas.

are used to develop national and state-level estimates of change in MFIs. (State-level ACS income data are now available for calendar years 2000 through 2005.) BLS local area wage data are used to develop an indicator of relative income change within states, but adjusted so that when summed to the state level they produce the same change as the ACS. Based on research, HUD is currently using a combination of state ACS and local BLS data to update local 2000 Census-based MFI estimates until more localized ACS data begin to be available.<sup>9</sup>

The step-by-step procedures used to develop FY2007 estimates for smaller areas are as follows:

1. The 2000 Census was used to estimate what are treated as mid-1999 local median family income estimates.
2. Census 2000 and 2005 American Community Surveys were used to estimate the change in State MFIs for the mid-1999 to end-2005 period. The state income changes for the 1999-2005 period were calculated as follows:

$$\frac{\text{ACS state MFI (2005)}}{\text{Census state MFI (1999)}} = \text{6-year increase factor for ACS Median Family Income} = \text{ACS State Income Change}$$

For areas not covered by local ACS income estimates, the most significant change between the FY2006 and FY2007 HUD median family income estimation process is in this step. Previously, HUD trended 2000 Census state MFIs by the change in national MFI between 1999 and 2000 using Current Population Survey (CPS) median income changes. Trending for the post-2000 period through the year of the most current ACS data available (2005) was done using changes in ACS state MFI estimates. Because the 2005 ACS state MFI estimates are the first to be based on full ACS samples, they have a much greater degree of reliability than previous (2000 to 2004 ACS) state MFI estimates. Therefore, in the FY2007 HUD MFI estimates, HUD is using direct comparisons between the state estimates from the 2000 Census and the 2005 ACS to calculate state-level changes, rather than using a combination of CPS-to-CPS and ACS-to-ACS changes and applying them to 2000 Census estimates. As discussed previously, the new procedure has the effect of producing a number of downward adjustments to state median family income estimates due to inherent differences between the 2000 Census and the ACS. HUD anticipates that as local ACS MFI estimates become available for smaller areas, they will also reflect the negative differential between 2000 Census and ACS MFI estimates noted previously. That is why HUD is now implementing this change in estimation methodology.

3. State and Local (metropolitan areas and nonmetropolitan counties) BLS average wage changes for all employees for the 1999-2005 period were calculated:

$$\frac{\frac{\text{BLS Wages (2005)}}{\text{BLS Employees (2005)}}}{\frac{\text{BLS Wages (1999)}}{\text{BLS Employees (1999)}}} = \text{6 year BLS wage increase factor} = \text{BLS Average Wage Change}$$

<sup>9</sup> See the ACS operations plan at <http://www.census.gov/acs/www/Downloads/OpsPlanfinal.pdf> for further details.

- Local area update factors were derived using local BLS average wage changes in conjunction with state-level income changes. They were combined according to the results of research done on the determinants of income change between 1990 and 2000<sup>10</sup>.

$$(17\% * \text{Local BLS Average wage change}) + (83\% * \text{ACS State Income Change}) = \text{Local Update Factor}$$

- A state-level factor was generated by computing the employee-weighted average of the local area BLS wage change data for the state and adding the same proportion of the ACS state income change, as follows:

$$(17\% * \text{State Weighted Average Local BLS wage changes}) + (83\% * \text{ACS State Income Change}) = \text{State Update Factor}$$

- A state ACS control factor was developed that adjusted for differences between the aggregated results of the step 5 local update factors and the Census-ACS state-level change factor for the same period.<sup>11</sup> This was done as follows:

$$\frac{\text{ACS State MFI (2005)}}{\text{Census State MFI (1999)}} = \text{State Control Factor}$$

State Update Factor  
(from step 5)

- Local area update factors were adjusted with the state control factor as follows:

$$\text{Local update factor (step 4)} * \text{State Control Factor (step 6)} = \text{Adjusted Local Update Factor}$$

- Convert the step 1 median family income estimate to an April 1, 2007, estimate as follows:

$$\begin{aligned} &\text{Step 1 median family income} \\ &* \text{Step 7 Adjusted Local Update Factor} \\ &* 1.035 \text{ (3.5\% annual trending) } ^{1.25} \text{ years} \\ &= \text{FY 2007 Median Family Income estimate} \end{aligned}$$

Although HUD is revising its median family income estimates to use the new ACS data, it is continuing its hold-harmless policy with respect to income limits. That is, HUD will continue to set income limits at the higher of normal income limit calculations or at the previous year's income limits.

<sup>10</sup> The equation is the result of an Ordinary Least-Squares regression on metropolitan area data where the dependent variable is the change in local median family income between 1989 and 1999 (decennial census income years), and the independent variables are the change in state median family income and the change in BLS local average wages during the same period.

<sup>11</sup> Changes in BLS-reported average wages, even though they are a component of family income, are not a direct measure of changes in family income and require adjustment if being used for that purpose

## ATTACHMENT 2

### FY 2007 MEDIAN FAMILY INCOMES FOR STATES, METROPOLITAN AND NONMETROPOLITAN PORTIONS OF STATES

	FY 2007			1999		
	TOTAL	METRO	NONMETRO	TOTAL	METRO	NONMETRO
ALABAMA	48700	51800	42800	41657	44345	36633
ALASKA	70900	73400	65200	59036	61161	54260
ARIZONA	54400	56600	40400	46723	48590	34682
ARKANSAS	45600	50000	40400	38664	42408	34268
CALIFORNIA	65000	65500	51500	53024	53451	42074
COLORADO	66000	68500	52400	55870	58000	44319
CONNECTICUT	79800	80300	74800	65521	65943	61354
DELAWARE	67500	71600	55200	55258	58619	45203
DISTRICT OF COLUMBIA	54300	54300	.	46283	46283	.
FLORIDA	53300	54100	42900	45625	46303	36703
GEORGIA	56800	60500	43000	49280	52536	37277
HAWAII	70200	74100	62300	56961	60118	50547
IDAHO	51500	55100	46400	43490	46523	39157
ILLINOIS	64600	67800	50600	55545	58262	43476
INDIANA	57100	58800	51900	50261	51692	45683
IOWA	58100	63400	53100	48005	52409	43847
KANSAS	57100	64000	47900	49624	55623	41651
KENTUCKY	48800	57600	39100	40938	48265	32782
LOUISIANA	48300	51300	39700	39774	42193	32654
MAINE	55300	60800	49100	45179	49629	40087
MARYLAND	79100	80100	64100	61875	62636	50109
MASSACHUSETTS	75700	75700	71700	61663	61673	58382
MICHIGAN	60500	63800	49900	53457	56384	44086
MINNESOTA	67600	74100	54700	56872	62325	45957
MISSISSIPPI	43200	49900	38800	37405	43160	33535
MISSOURI	54400	60200	42800	46045	50949	36187
MONTANA	50700	54100	48900	40488	43226	39044
NEBRASKA	58200	66200	50400	48032	54645	41598
NEVADA	60300	60600	58400	50849	51078	49209
NEW HAMPSHIRE	71200	77200	63000	57577	62443	50966
NEW JERSEY	79600	79600	.	65370	65370	.
NEW MEXICO	46600	51100	39700	39425	43195	33627
NEW YORK	63100	64500	50900	51691	52887	41753
NORTH CAROLINA	52100	56000	45700	46335	49800	40571
NORTH DAKOTA	56100	64100	51000	43656	49842	39664
OHIO	57200	59000	50000	50037	51617	43778
OKLAHOMA	48600	52800	42400	40709	44258	35546
OREGON	55700	59400	45600	48680	51880	39834
PENNSYLVANIA	59100	61200	49800	49184	50959	41452
RHODE ISLAND	68300	68300	.	52780	52780	.
SOUTH CAROLINA	50800	53100	44700	44227	46219	38930
SOUTH DAKOTA	53300	60100	48700	43234	48701	39484
TENNESSEE	50700	54400	43100	43517	46735	36972
TEXAS	52600	54800	41800	45862	47797	36410
UTAH	57700	59200	46600	51022	52316	41227
VERMONT	60400	68800	57300	48625	55412	46087
VIRGINIA	68900	73800	49600	54169	58055	39000
WASHINGTON	63500	66000	49900	53761	55868	42260
WEST VIRGINIA	45300	50100	40300	36484	40433	32454
WISCONSIN	62000	65600	54700	52912	56008	46677
WYOMING	58500	59100	58200	45685	46159	45472
US	59000	61800	47300	50046	52413	40111