# The Definition of Affordable Housing: Concerns and Related Evidence

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## Introduction

This paper evaluates three critiques of the 30% of income criteria typically used to define housing affordability. It is important to evaluate them because this standard criterion is commonly used to assess need and establish eligibility for most federal, state, and local housing programs (Miles et al. 2007). Evidence is presented that supports several concerns, suggesting that affordable housing studies and programs should go beyond the 30% of income criterion and pay more attention to neighborhood quality, accessibility, and the ability of families to afford non-housing essentials. With regard to non-housing essentials, there is a particular need for better information about how much money should be budgeted for healthcare and childcare by lower income families in order to determine whether their non-housing essentials can be paid for after spending 30% of their income on housing and utilities.

The provision of affordable housing is a key goal for many agencies and organizations in the USA. In 2004 Odell et al. (2004) called affordability the greatest housing problem in the nation. Since the last recession, the incidence of severe cost burden, where a household pays more than half its income for housing, has risen sharply. By 2010, more than 20 million households were severely cost burdened (Joint Center for Housing Studies of Harvard University 2012). In comparison, in the 4$^{th}$ quarter of 2011 about 11 million homeowners were underwater on their mortgages (Madigan 2012). And in 2009 about 5.7 million housing units had severe or moderate physical problems (US Department of Housing and Urban Development and US Census Bureau 2009). So, while affordability is not the only housing problem, it may indeed be the largest.

The standard definition for affordability is that households should pay no more than 30% of their income for housing, including utilities (O'Dell et al. 2004). Families that pay more, especially lower income families, are considered cost burdened because they may have difficulty paying for non-housing needs such as food, clothing, transportation, childcare, and medical care (US Department of Housing



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and Urban Development 2012). The 30% standard can be applied to any income group. It is mostly used, however, to assess housing available to families earning less than the area median income. Those families are typically classified into “very low income” families earning less than 50% of area median income (AMI), “low income” families earning 50 to 80% of AMI, and “moderate income” families earning 80 to 100% of AMI.

One criticism of the 30% rule, known as the shelter poverty critique, has been raised by several authors (Linneman and Megbolugbe 1992, Stone 1993, 2006, Hulchansky 2005, Bogdon and Can 1997, O’Dell et al. 2004, Jewkes and Delgadillo 2010). The issue is that lower income households may not be able to pay 30% of their income for housing and still have enough money left to purchase other basic needs for food, transportation, healthcare, and so on. “Shelter Poverty” was coined by Stone (1993) to describe the situation where households that pay 30% of their income for housing are left with too little money to meet their other essential needs.

If a family cannot afford non-housing needs after paying 30% of its income for housing, it is not because housing is too expensive. It is because their income is too low or the cost of their non-housing needs is too high. For that reason, the shelter poverty critique is as much a challenge to what workers earn and the cost of other essential needs and services as it is a comment on the cost of housing. Nevertheless, language matters, and if we define housing as affordable to families in a certain income group under the 30% rule, even though paying that much may require them to forego other essential needs like food and healthcare, it would be misleading to define the housing as affordable to that income group. Moreover, benchmarks that measure our progress in providing affordable housing to lower income groups based on the 30% rule would be overstating our actual achievement of real affordability.

A second criticism of the 30% criterion is that it simply compares direct housing costs (rent plus utilities) to income and ignores differences in costs related to neighborhood quality or accessibility. Fisher et al. (2009) refer to these costs as “area affordability”. They explain that the “spatial opportunity set facing households” can vary by location within a metropolitan area because of differences in accessibility to jobs and locational amenities. They measure these costs in connection with school quality, job accessibility, and crime rates, because those features are known to be important in household location decisions. Other factors could be considered as well, such as exposure to environmental hazards.

Haas et al. (2008) raised similar concerns, though they focused on the transportation related costs of housing location options. They developed a method for estimating transportation expenditures by neighborhood so they could count the transportation expenses facing households along with housing costs when the affordability of housing was being evaluated. That work led to the creation of the H+T Affordability Index (Center for Neighborhood Technology 2012).

A third criticism of the 30% standard is that it ignores physical or structural housing conditions. If most condition problems occur in units occupied by lower income families, then physical conditions and affordability to lower income households may be related. That would mean that for lower income families, gains in housing cost may be offset by losses in housing condition (O’Dell et al. 2004).

The evidence presented below provides mixed support for these critiques. It appears that the adequacy of our definition turns on unresolved questions about the cost of certain non-housing expenses faced by lower income families, especially for healthcare and childcare. Findings also show that families who occupy certain types of low income housing with rent subsidies and income restrictions experience location specific disadvantages related to commuting, access to retail services, crime, poverty, education, and flooding.

The 30% criterion is commonly used to discuss our nation's supply of affordable housing or the contribution made to that supply by various institutions. For example, Fannie Mae (2011) recently reported that according to the 2009 American Housing Survey (US Department of Housing and Urban Development and US Census Bureau 2009), more than 80% of the nation's rental housing units "are considered affordable to people earning less than their area's median income (AMI) – *where rent payments comprise no more than 30% of income* (emphasis added)." But if the critics are correct, then the units that meet the 30% criterion may be affordable to fewer people than we thought, or should at least be further described in terms of their area affordability, transportation costs, physical condition or other issues that are not considered in the 30% metric.

## Analysis

Each of the criticisms concerning shelter poverty, area affordability and physical conditions can be tested against empirical evidence, which was done for this paper. The work proceeded in two parts.

The first part examined whether families have enough money left over to cover essential non-housing needs if they pay 30% of their income for housing and utilities. To conduct that analysis data were obtained from work on the Self-Sufficiency Standard by the University of Washington Center for Women's Welfare (Center for Women's Welfare 2012). Data were also collected from work on the Supplemental Poverty Measure (SPM) by the US Census Bureau and the US Bureau of Labor Statistics (Short 2011). Both of these projects have put a great deal of effort into estimating the resources available to families and what is required to meet minimum family needs.

The second part of the work focused on whether multifamily housing units that qualify as affordable to different levels of lower income families under the 30% criterion face greater area affordability or property condition issues than units that do not meet that criterion. Data for the second part was obtained from Fannie Mae, supplemented with additional data from several different sources on neighborhood or locational factors.

### The Shelter Poverty Issue

The CWW and SPM datasets were analyzed separately in order to obtain two different tests of the Shelter Poverty issue. In both cases the data were used to determine the total resources available to families and their cost of meeting non-housing needs. The cost of non-housing needs was then subtracted from total family resources to find the residual amount that could be spent on housing and utilities without sacrificing the capacity to obtain non-housing essentials. Total family resources included income and other financial resources (e.g. earned income tax credits and the in-kind value of food

stamps). For the CWW dataset, other financial resources included the amounts households were *qualified* to receive, while for the SPM dataset other financial resources included the amounts households *actually* received. The housing residual was then converted to a percentage of household income. If it was less than 30%, the evidence supported the shelter poverty critique.

### Center for Women's Welfare Data

Table 1 illustrates the data obtained from the Center for Women's Welfare (CWW). It gives information on Pima County, Arizona, which includes the City of Tucson. Data on three other areas were also examined: Lane County in Oregon (which includes the cities of Eugene and Springfield), Denver County in Colorado, and North Manhattan in New York County, New York. In all four cases, the data were for families with two adults, one preschooler and one school-age child for 2010, 2011 or 2012, depending on the location. The monthly income limits are percentages of the area median family income for each county (New York County in the case of North Manhattan), published by the US Department of Housing and Urban Development (HUD).

A detailed explanation of the methodology used for the cost estimates can be found in Pearce (2012); however a few key explanations should be given here. First, the child care costs were derived from market-rate studies conducted by state agencies. They include state subsidies but exclude "private subsidies" provided by relatives or others at no or low cost. Given the latest research showing that more than 60% of grandparents provide grandchild care, the CWW estimates may be high (Luo et al. 2012) but it seems invalid to assume households would have access to private subsidies when setting an affordable housing standard. Food costs are based on the US Department of Agriculture Low-Cost Food Plan, adjusted for local differences. Federal food subsidies from the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) were included in the food cost estimates, but the value of any school lunch support was not because the CWW analysts do not include them in their estimation method. Transportation costs assume that each adult uses a car to get to work unless US census data showed that at least 7% of the workforce use public transportation, which was the case for the North Manhattan estimate. Except in North Manhattan, two cars were assumed for these two-adult households and the transportation costs are based on the average cost of owning and operating the cars. For North Manhattan, it was assumed that adults use public transportation and pay the cost of a transit pass. Healthcare costs assume employer-sponsored health insurance. However, a third of all workers (full- and part-time) in the US did not have employer-based health insurance in 2010 (Brault and Blumenthal 2011), so the health care estimates used here may underestimate what some families pay for medical care if they are paying for their own insurance, and overestimate what other families pay if they are uninsured and choosing to avoid healthcare expenses. Taxes are calculated for the specific household type and income level and include federal, state and local taxes. The Child Care Tax Credit and Child Tax Credit can be used to offset income taxes, so it is included as a reduction in monthly costs. Annual refunds expected from the Child Tax Credit and Earned Income Tax Credit are given in terms of monthly supplements. State earned income tax credit programs exist in Oregon and New York and were included in the monthly supplement estimates for those regions.

The bottom line in Table 1 gives the results of this first analysis using the CWW data. It shows, for example, that very low income families, which earn half the Pima County area median income, would have 22.6% of their household income available for housing and utility costs after paying for other non-housing essentials. It should be noted that this is after including resources from the various subsidy, welfare, and tax credit programs mentioned above. The percentage of income available for housing would be far lower if these assistance programs became unavailable or were excluded from the calculations.

Table 2 gives the results for all of the income levels and locations examined. The percentages represent what will be referred to below as the "Shelter Poverty Threshold", meaning that families which pay more than that percentage of their income for housing would be in shelter poverty status where they have less money than they need to cover their basic non-housing needs. Only extremely low income families, except in Pima County, could meet their needs after paying 30% of their income for housing. In the locations studied, refundable tax credits received by the extremely low income households averaged $615 per month and covered an average of 32% of total non-housing expenses. This compares to an average of 18% for very low, 20% for low and 17% for moderate income families. If not for the refundable tax credits, the Shelter Poverty Threshold for extremely low income families would also be lower than 30% in all locations. In Pima County, where expenses are much higher relative to incomes compared to the other locations, and where there is no state earned income tax credit program, the Shelter Poverty Threshold is already below the 30% affordability criterion. The very low thresholds for Denver's very low and low income families are due to the fact that childcare subsidies in Colorado are not provided above a lower income level than in the other states studied. Overall, these findings support the Shelter Poverty critique of the 30% affordability criterion except in the case of the very poor in some areas where they are protected by critical income subsidy programs and non-housing expenses are not too high relative to incomes.

### Supplemental Poverty Measure

The Official Poverty Measure is used by the federal government to determine the poverty status of families in the US. The measure consists of poverty thresholds for various family types. The poverty thresholds are compared to family incomes to count the number of people living in poverty. Concerns about the adequacy of the measure led to work on a research Supplemental Poverty Measure (SPM), which is now produced by the Bureau of Labor Statistics and Census Bureau (Short 2011). The SPM changes the definition of both the poverty threshold and family resources. To produce the SPM, researchers compile data on expenditures by families. Those data were used for the present study as a second test of the shelter poverty critique.

The SPM method includes the estimation of SPM thresholds. SPM thresholds are estimates of the cost of buying an essential set of basic goods, recommended by an Interagency Technical Working Group, including food, clothing, shelter and utilities (FCSU) plus an additional 20% for other needs such as household supplies, personal care, and non-work-related transportation (Garner 2010, Short 2011). SPM thresholds are produced by the Bureau of Labor Statistics from 5 years of data from the Consumer Expenditure Survey by observing expenditures made by consumer units at the 33$^{rd}$ percentile of the expenditure distribution. The 33$^{rd}$ percentile is taken as the minimum level of spending required to

avoid poverty. For the present study, figures were extracted from the 2010 SPM thresholds for the cost of food, clothing and other additional needs for 2 adult, 2 child families living in rented housing. This value, which was equal to the SPM threshold minus the cost of housing and utilities, came to $12,277. It should be noted that the figure is a single national norm, unadjusted for regional differences.

To estimate the incidence of poverty in America, the Census Bureau compares the total SPM resources available to the sample of families in the Current Population Survey Annual Social and Economic Supplement to the SPM threshold for their family size and housing tenure. Total SPM resources include total family cash income for the year plus the value of in-kind benefits minus necessary expenses for critical goods and services not included in the SPM thresholds[2].

The Census Bureau has published public use micro-files containing these data for 2009 and 2010. For the present study, a subset of the 2010 data set was analyzed, which included just the families with two adults and two children living in rented housing. That sample included 7,812 families.

The Shelter Poverty Threshold was computed for each of the families in the sample as follows: First, the cost of food, clothing, and other essentials needed to avoid poverty for families with 2 adults and 2 children (calculated from the SPM threshold as described above) was subtracted from the total SPM resources included in the data file for each family. (Remember, total SPM resources included cash income minus the cost of essentials not included in the SPM threshold.) The difference was the amount available to each family for housing and utilities after expenditures needed to avoid poverty. The difference was then divided into total family cash income. The quotient was the family Shelter Poverty Threshold, that is, the percentage of family income that each family could afford for housing and utilities and still have enough left over to cover other non-housing essentials.

After these shelter poverty thresholds were computed for each family in the sample, the sample was split into groups based on the percentage of the national median family income represented by total family cash income.[3] Descriptive statistics for shelter poverty thresholds for each group, along with the other variables used in the computation are given in Table 3.

[2] In-kind benefits include Supplemental Nutritional Assistance (SNAP), the National School Lunch Program, the Supplementary Nutrition Program for Women, Infants, and Children (WIC), housing subsidies, and Low Income Home Energy Assistant (LIHEAP). Necessary expenses include taxes (plus credits such as the Earned Income Tax Credit, the Child Tax Credit, and the Child and dependent Care Tax Credit), expenses related to work, childcare expenses, child support paid to another household, and medical out-of-pocket expenses.

[3] The definition of family income used here corresponds to the definition used by HUD to compute median family income. Income includes all money income reported in the Current Population Survey Annual Social and Economic Supplements conducted by the U.S. Census Bureau. Family income includes earnings, unemployment compensation, workers' compensation, social security, supplemental security income, public assistance, veterans' payments, survivor benefits, disability benefits, pension or retirement income, interest, dividends, rents, royalties, and estates and trusts, educational assistance, alimony, child support, financial assistance from outside of the household, and other income. Money income does not include noncash benefits, such as food stamps, health benefits, subsidized housing, and goods produced and consumed on the farm. It also excludes the use of business transportation and facilities, full or partial payments by business for retirement programs, medical and educational expenses, etc. (DeNavas-Walt et al. 2012).

According to the mean Shelter Poverty Thresholds given in Table 3, the average family in all of the income levels could afford to pay more than 30% of their income for housing and utilities in 2010 and still have enough left over to cover what they required to avoid poverty and meet their other essential non-housing needs. Even those with thresholds at the 25$^{th}$ percentile could afford housing provided at 30% of their income amounts. Unlike the results from the CWW data, these findings do not support the argument that families may not be able to pay 30% of their income for housing and still have enough money to purchase other basic needs for food, transportation, healthcare, and so on.

### Comparison of the Two Approaches

How is it possible for the SPM and CWW data to produce such different results? Differences in how the two studies define and categorize expenses makes it difficult to directly compare all of their estimates, but it is clear that the SPM and CWW methods make very different assumptions when it comes to medical and work related spending (including child care and transportation). In both cases, the CWW data estimates are much higher than those found in the SPM data.

For medical care, according to the CWW data, 2 adult, 2 child families earning 30% to 80% of AMI would need to spend an average of $5,277 per year for the 4 regions studied. This compares to a median expenditure of $900 for the same types of families in the SPM data. The CWW data assumes that each family will have employer provided health insurance and will pay the average employment-based health premium paid by an employee for a family plus out-of-pocket costs. The costs are estimated from medical expenditure survey data obtained by the US Department of Health and Human Services (Pearce, 2012). In contrast, the SPM data uses actual expenditures on health insurance premiums plus other medically necessary items, including amounts paid by the uninsured, which could result in lower medical service utilization and unmet needs. That is, “only expenditures are captured in the SPM and not met needs” (Short and Garner 2012). The SPM Interagency Technical Working Group has recommended investigating an adjustment for the uninsured (Short and Garner 2012). Such an adjustment would lower the Shelter Poverty Threshold from the SPM data, as calculated in this paper. Both sources, CWW and SPM recognize that the Patient Protection and Affordable Care Act may affect their estimates in the future.

Another difference between the SPM and CWW affects their estimates for transportation costs. The CWW data for the regions studied include an average yearly transportation cost of about $5,300 for families earning 30% to 80% of AMI. This compares to a median expenditure of $1,326 per year for commuting expenses in the SPM sample. The figures for the SPM data exclude non-work related transportation, which are included in another variable, while the CWW adds about 20% to the estimated commuting costs to reflect shopping and errands. If the CWW figures are lowered by 20% to exclude non-work transportation, the median cost would be about $4,200, which is still about $2,900 more than the figure found in the SPM data.

The largest difference between the SPM and CWW comes from how they handle childcare. In the SPM data, 2 adult, 2 child families earning 30% to 80% of the US median family income spent an average of $502 per year for childcare. Meanwhile, the CWW estimates that 2 adult, 2 child families earning 30% to 80% of AMI would need to pay an average of $8,251 for childcare. The CWW assumes the market-rate

(i.e. the 75th percentile) for childcare without free or low cost care from relatives or others, although for the present study state subsidies are included in the CWW estimates. In addition, for the present study, it was assumed that one of the children in the home would be school age and one would be a preschooler, which requires more expensive childcare than two school age children.

Altogether, the CWW expense estimates for work related transportation, childcare, and healthcare for 2 adult, 2 child families earning 30% to 80% of the AMI was more than $15,000 greater than estimates made for similar expenses for the SPM. If $15,000 were removed from the resources available to these lower income families in the SPM sample, they would no longer be able to afford 50-60% of their family income for housing, which was shown in Table 3. They would only be able to afford 14% of their income for housing. This would bring both the analysis based on the SPM data and the one based on the CWW data into agreement with one another that the 30% affordability standard is too high to allow lower income families to meet their non-housing needs.

Clearly, there is an important unresolved question about the non-housing expenses that should be assumed when evaluating the adequacy of the 30% affordable housing criterion. Assumptions about how much money should be budgeted for healthcare and childcare in particular are critical to judging whether the 30% rule leaves enough money for families to afford other essential items or whether it puts them into shelter poverty status. From this perspective it appears that the affordability of housing is itself dependent on access to affordable healthcare and childcare in America. It also depends, of course, on the earning capacity of lower income families, which itself depends on the availability of job opportunities that pay a "living wage" (i.e. enough to meet basic needs) or the provision of equivalent public supplements (Glickman 1997).

## Area Affordability and Physical Conditions

The area affordability and physical conditions issues raise the argument that affordable housing is located, built, or maintained in ways that burden their occupants with higher costs than those living in conventional housing. Some of the costs could be pecuniary, like higher commuting costs, and some could be nonfinancial, like exposure to crime. The argument, in effect, is there are "hidden costs" faced by occupants of affordable housing that are not computed in our standard way of measuring housing affordability, which, if included, would make housing less affordable because there are hidden costs that are being ignored.

To test this proposition, data on various indicators related to area affordability and physical conditions were collected for 40,891 multifamily properties with mortgages owned by Fannie Mae (excluding student and senior housing). There were 4,025 "targeted" properties in the dataset that were then compared to the other "non-targeted" properties. The definition of a targeted property was one that is part of the Fannie Mae Targeted Affordable Segment, which finances properties that are under a regulatory agreement or covenant that provides long-term affordability, such as properties with rent subsidies or income restrictions. At least 20 percent of the units must be rent restricted and occupied by households with incomes at or below 50 percent of the HUD-determined area median income (adjusted for household size) or at least 40 percent of the units (25% in New York City) must be rent restricted and occupied by households with incomes at or below 60 percent of the HUD-determined area median

income (adjusted for household size). The findings below only compare area affordability and physical conditions for targeted and non-targeted multifamily housing. Some of the non-targeted housing would probably qualify as affordable to various income groups. Therefore, it is important to note that this analysis does not resolve whether the area affordability and physical conditions critiques are valid for non-targeted affordable housing properties.

The following is a more detailed description of the data sources that were merged with the Fannie Mae file and the results of the comparisons between targeted and non-targeted properties. Detailed figures are given in Table 4.

### Journey to Work

In order to find more affordable sites on which to build targeted housing, developers may have to locate projects in less accessible locations, where people must drive alone to work, own more cars, or face longer commute times. This would obviously offset some or all the benefits gained by households in the form of lower rents. To examine this topic, census tract level data from the 2000 US Census were matched to the properties in the Fannie Mae file using addresses and geocodes. Additional data were gathered on the location of fixed rail transit stations from the National Transportation Atlas, which was used to measure the straight-line distance from the properties in the sample to transit stations using geospatial software. This made it possible to compare access to fixed rail transit, means of transportation to work (driving, bus, transit, walking, etc.), and journey to work times, in census tracts where the targeted and non-target housing was located. The sample was also subdivided into properties that were and were not inside a Principle City[4] and the comparisons repeated for each group. Principle Cities were considered a proxy for level of transit service at the city scale and the separate analyses were done to see if the results were sensitive to city-scale transit service.

On average (see Table 4), the targeted properties were in tracts where more workers drove alone to work compared to the tracts where the non-targeted properties were found (71.7% vs. 65.6%) Also, fewer workers in the tracts with targeted housing used transit of any kind (bus, subway, etc.) (8.0% vs. 14.5%) and fewer two-worker households had 1 or no cars.

Workers in the tracts with targeted housing used any transit for their journey to work 6.5% less than in the tracts with non-targeted housing. Nearly half the difference (3.7%) was caused by the percentage of workers who used a subway or elevated train, suggesting the targeted affordable housing was not located near fixed rail transit stations as often as other multifamily housing. Data on the distance to

[4] The largest incorporated place in a core based statistical areas (CBSA) with a population of at least 10,000, or if no such incorporated place exists, the largest incorporated place or census-designated place in the CBSA is designated as the largest principal city. Additional principal cities can be included if they satisfy certain criteria depending on their population. These additional principal cities are: (a) incorporated or census-designated places that have a population of at least 250,000 in which the number of workers is 100,000 or more; (b) places with a population between 50,000 and 250,000 where the number of workers working in the place exceeds the number of working residents; and (c) places with a population between 10,000 and 50,000 where the number of workers working in the place exceeds the number of working residents and are at least one-third the population of the largest principal city. Principal cities encompass both incorporated places and census designated places (CDPs).

transit stations confirmed that hypothesis: fewer targeted properties were located within walking distance of a fixed rail transit station.

When separate analyses were done for properties inside and outside of Principal Cities, where the transit level of service could differ, similar findings were observed (see Table 5). In the Principal Cities, 68.5% of the workers in tracts with targeted properties drove alone to work compared to 64.5% for tracts where the non-targeted properties were found. Outside Principal Cities, where transit options are presumably less common, the difference was larger (76.6% vs. 67.2%). The same was true for the transit use figures. In Principal Cities, about 14.5% took any type of transit in 2000 in the tracts with non-targeted multifamily housing compared to 9.7% in tracts with targeted housing. Outside Principal Cities the figures were 14.4% and 5.5%. Here again, most of the differences in total transit use are due to differences in subway or elevated transit use.

All of these observations would appear to support the hypothesis that targeted housing is located in more auto-dependent locations with fewer public transportation services than non-targeted housing. This of course could make commuting more difficult or more expensive for families living in the targeted housing. It is possible, however, that the lower transit use in tracts with targeted housing is a matter of choice by the residents rather than a result of lower transit services. But according to the US Census, transit use increases with declining household income (Bureau of Transportation Statistics 2000) and average incomes were lower in the tracts with targeted housing (see Table 4). So it seems more plausible to think that the lower transit use in tracts with targeted housing resulted from lower transit service than from a greater preference by the residents for driving.

With regard to journey to work travel time, one would expect that if there was more driving alone and less transit use in tracts with targeted housing, there would also be shorter commute times because transit tends to move more slowly than single occupant vehicles. That was the case across the entire data set as well as when the data was split into properties inside and outside Principal Cities.

Overall, these findings support the hypothesis that affordability is being achieved at the expense of greater auto dependence and any associated household, social, and environmental costs. However, this analysis was based on average commuting in census tracts. A direct survey of commuting costs and services faced by households in targeted vs. non-targeted housing would be a more accurate way to evaluate this issue. It would be worth the effort to conduct such a survey given that households spend about 13% of their after tax income on transportation expenses, according to the 2011 Bureau of Labor Statistics Consumer Expenditure Survey.

### Local Accessibility

Local accessibility refers to the availability of goods and services close to home. It is related to walkability because walking tends to increase when there are goods and services nearby. Perceived safety, topography, sidewalk width, traffic volume and other factors also affect walking, but the most important factor is the presence of desired destinations within walking distance (Pivo and Fisher 2011). Walkability ratings were collected from Walk Score. Walk Score rates the walkability of an address by determining the distance to educational (schools), retail (groceries, books, clothes, hardware, drugs,

music), food (coffee shops, restaurants, bars), recreational (parks, libraries, fitness centers), and entertainment (movie theaters) destinations. The algorithm awards points based on distance to the nearest destination of each type using Google Maps. If the closest establishment of a certain type is within one-quarter mile, Walk Score assigns the maximum number of points for that type. The number of points assigned declines as the distance approaches 1 mile and no points are awarded for destinations further than 1 mile. Each type of destination is weighted equally and the points assigned to each category are summed and normalized to yield a score from 0–100.

These data were used to compare local accessibility for the targeted and non-targeted properties. As shown in Table 4, the average Walk Score for the targeted properties was 22% lower than for the conventional properties. That suggests that targeted units are located in areas with less local accessibility. In that case, residents would have to drive further and would be less likely to walk to obtain household goods and services. That would increase their annual transportation costs and discourage physical activity, which has been linked to various health outcomes (World Cancer Research Fund/American Institute for Cancer Research (2009).

### Neighborhood Socioeconomic Conditions and Public Safety

Data from both the 2000 Census of Population and Housing and the 2006-10 American Community Survey 5-year estimates were used to look at income, poverty and educational conditions around the study properties. The targeted properties were found to be located in neighborhoods with lower incomes and higher poverty rates. They were also found to be located where fewer school-age children over the age of 15 attend school and where a smaller share of school age children of any age attend private school. These figures are consistent with what most people probably assume; that lower income housing is concentrated in more disadvantaged neighborhoods where there is more need for it. The figures are also consistent with the city-level crime data obtained from the US Department of Justice. The average crime rates for the cities where targeted housing was found was 21% higher for total crime, 21% higher for property crime, and 14% higher for violent crime rate, compared to cities with non-targeted properties. To the extent that there are demonstrable social costs associated with lower income, higher crime areas with greater education issues, targeted housing properties appear to be located more often where those costs occur. While one might argue that targeted housing should be located in low income areas, because “that is where the need is”, there is growing evidence that neighborhood conditions and the presence of middle-class neighbors benefit lower income families and children in terms of employment, crime, delinquency, educational outcomes, health and sexual activity (Leventhal and Brooks-Gunn 2000, Joseph 2006). Concentrating lower income housing where there is more poverty, crime, and educational problems creates disadvantages for residents that probably offset at least some of the benefits gained from lower rents. That is one reason why regional housing plans often call on all communities to provide their “fair share” of low and moderate income housing.

### Environmental Conditions

Three separate datasets were consulted to compare the environmental conditions surrounding the properties. The first was the Protected Areas Database (PAD) of the United States. It is a GIS database hosted by the US Geological Survey that describes conservation lands nationally, including public conservation areas and voluntarily provided privately protected areas. The PAD was compared to the

property locations, and it showed that fewer targeted properties were located with ½ or 1 mile of protected areas. The average targeted property was 2.4 times farther from the nearest protected open space than the average non-targeted property. The second dataset consulted was the National Flood Hazard map collection, maintained by the Federal Emergency Management Agency. That comparison showed that the percentage of targeted properties located in high flood risk areas was more than twice the percentage of non-targeted properties. The third database consulted was the National Transportation Atlas, produced by the Bureau of Transportation Statistics. It showed that a higher percentage of targeted properties were within 1,000 feet of a freeway edge, but the difference was not statistically significant. Still, given the emerging evidence that there are more cancers, heart disease, and respiratory diseases among those living close to freeways, it is a point that deserves closer scrutiny (Pearson et al. 2000, Gauderman et al. 2007, Rosenbloom et al. 2012.)

### Property Conditions

As noted in the Introduction, a third criticism of the 30% standard is that it ignores physical or structural housing conditions. The concern is that the benefits of affordability may be offset by losses in housing condition if targeted units are in poor condition (O'Dell et al. 2004). To test this, the most recent condition ratings given to the targeted and non-targeted properties in the Fannie Mae dataset were compared. As shown in Tables 6 and 7, affordability was associated with fewer condition problems, not more. One possible explanation for this difference is age. As shown in Table 3, the median age for the targeted properties was 18 years compared to 43 years for the non-targeted properties. Another possible explanation is that targeted properties are monitored by the states and federal government to ensure they are in good condition. These findings do not support the idea that gains in affordability are being offset by losses in physical conditions.

## Summary and Conclusion

Critics have been concerned that the 30% rule for defining affordable housing may be flawed. Their concerns need to be taken seriously given the importance of the affordability issue and how often the 30% criterion is used to gauge progress toward affordability goals.

Three concerns about the issue were tested in this paper.

The first concern, which has been called the Shelter Poverty issue, is that lower income families that pay 30% of their income for housing may not have enough money remaining to cover other essential needs. The analysis found the critique may or may not be correct, depending on estimates made about non-housing costs, especially for healthcare and childcare. We need to resolve the cost estimation issue before the shelter poverty issue can be more fully evaluated.

The second concern was that affordable housing may be subject to additional "area affordability" costs because they may be located where families have to bear additional costs due to environmental, social, or transportation conditions. The evidence examined here confirmed that in fact families in affordable housing do have to deal with such costs.

The third concern was that affordability may be associated with housing condition problems. The evidence reviewed here did not support that concern. Targeted affordable buildings are in better condition than non-targeted ones, perhaps due to their lower average age on ongoing inspections.

Overall, there is evidence in this paper that supports concerns raised about the 30% criterion. But the issue requires closer study before a final judgment can be reached. There is disagreement over how to estimate non-housing needs, especially for health care and childcare. It would also be helpful to more directly observe the transportation and other area affordability costs experienced by residents of targeted vs. non-targeted housing. But for now, it seems safe to conclude that reports on affordability trends and programs aimed at supporting affordable housing should not be content to rely simply on the 30% of income criterion. Additional facts related to neighborhood conditions, accessibility, and the ability of families to afford their non-housing needs should be given more consideration.

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## Tables

| Table 1: Two Adults, One Preschooler, and One School-age Child: Pima County, AZ 2012 | | | | |
|---|---|---|---|---|
| | Income Limit (percent of area median income) | | | |
| | Extremely Low (30%) | Very Low (50%) | Low (60%) | Moderate (80%) |
| MONTHLY INCOME LIMIT | *$1,508* | *$2,517* | *$3,017* | *$4,025* |
| Monthly Costs | Monthly Costs | Monthly Costs | Monthly Costs | Monthly Costs |
| Child Care | *$33* | *$165* | *$330* | $1,181 |
| Food | *$314* | *$676* | *$676* | $718 |
| Transportation | $548 | $548 | $548 | $548 |
| Health Care | $450 | $450 | $450 | $450 |
| Miscellaneous | $376 | $376 | $376 | $376 |
| Taxes | *$119* | *$224* | *$315* | *$516* |
| Child Care Tax Credit (-) | *$0* | *($26)* | *($76)* | *($100)* |
| Child Tax Credit (-) | *$0* | *$0* | *$0* | *($93)* |
| Total Non-Housing Expenses | $1,841 | $2,413 | $2,619 | $3,598 |
| Monthly Supplements | | | | |
| Annual Earned Income Tax Credit | $436 | $297 | $192 | $0 |
| Annual Child Tax Credit | $167 | $167 | $167 | $74 |
| Total Resources (Income + Supplements) | $2111 | $2981 | $3376 | $4099 |
| Housing Residual (Total Resources – Total non-housing expenses) | $270 | $568 | $757 | $501 |
| Shelter Poverty Threshold (Housing Residual ÷ Income Limit) | 17.9% | 22.6% | 25.1% | 12.5% |

| Table 2: Shelter Poverty Thresholds | Extremely Low (30%) Income Limit | Very Low (50%) Income Limit | Low (60%) Income Limit | Moderate (80%) Income Limit |
|---|---|---|---|---|
| Pima Co., AZ, 2012 | 17.9% | 22.6% | 25.1% | 12.5% |
| Lane Co., OR, 2011 | 35.0% | 25.0% | 25.9% | 11.6% |
| Denver Co., CO, 2011 | 35.8% | 1.2% | 9.7% | 25.8% |
| North Manhattan, NY, 2010 | 38.7% | 22.1% | 19.4% | 17.1% |
| Mean | 31.9% | 17.7% | 20.0% | 16.8% |
| Median | 35.4% | 22.4% | 22.3% | 14.8% |

Table 3: Results From Supplemental Poverty Measure Data for Renters with 2 Adults + 2 Children, 2010

| Unit Income Groups (percent of 2010 US median family income) | | total family cash income | total SPM resources | Housing Residual (total SPM resources - SPM Threshold ex shelter & utilities) | Shelter Poverty Threshold (housing residual ÷ total family cash income) |
|---|---|---|---|---|---|
| 20-30% (n=771) | Mean | $15,348 | $26,081 | $13,805 | 63.7% |
| | Median | $15,000 | $23,450 | $11,173 | 62.1% |
| | Std. Deviation | $1,608 | $11,120 | $11,120 | 28.3% |
| | 25th Percentile | $14,100 | $20,122 | $7,845 | 49.9% |
| 30-40% (n=760) | Mean | $18,869 | $25,226 | $12,949 | 60.3% |
| | Median | $20,700 | $25,639 | $13,362 | 62.3% |
| | Std. Deviation | $6,272 | $5,156 | $5,156 | 22.1% |
| | 25th Percentile | $19,200 | $25,510 | $10,233 | 48.2% |
| 40-50% (n=856) | Mean | $26,177 | $29,614 | $17,337 | 63.3% |
| | Median | $27,580 | $30,396 | $18,119 | 65.9% |
| | Std. Deviation | $5,688 | $5,487 | $5,487 | 17.0% |
| | 25th Percentile | $25,002 | $27,969 | $15,692 | 56.9% |
| 50-60% (n=660) | Mean | $29,395 | $30,312 | $18,035 | 57.9% |
| | Median | $33,000 | $32,469 | $20,192 | 61.1% |
| | Std. Deviation | $10,160 | $23,326 | $23,326 | 16.1% |
| | 25th Percentile | $31,000 | $30,154 | $17,877 | 53.3% |
| 60-70% (n=688) | Mean | $34,747 | $35,733 | $23,456 | 59.2% |
| | Median | $39,000 | $35,953 | $23,676 | 60.0% |
| | Std. Deviation | $10,425 | $6,577 | $6,577 | 15.2% |
| | 25th Percentile | $37,000 | $32,613 | $20,336 | 51.1% |
| 70-80% (n=552) | Mean | $40,478 | $38,449 | $26,172 | 57.0% |
| | Median | $45,000 | $39,259 | $26,982 | 58.0% |
| | Std. Deviation | $12,002 | $5,732 | $5,732 | 12.2% |
| | 25th Percentile | $43,257 | $35,372 | $23,095 | 51.4% |
| 80-90% (n=484) | Mean | $47,417 | $42,152 | $29,875 | 57.0% |
| | Median | $51,632 | $43,034 | $30,757 | 58.6% |
| | Std. Deviation | $11,965 | $5,083 | $5,083 | 9.4% |
| | 25th Percentile | $50,000 | $38,813 | $26,536 | 51.9% |
| 90-100% (n=484) | Mean | $54,526 | $45,141 | $32,864 | 56.3% |
| | Median | $58,320 | $46,537 | $34,260 | 60.0% |
| | Std. Deviation | $11,141 | $7,699 | $7,699 | 12.3% |
| | 25th Percentile | $56,040 | $43,075 | $30,798 | 53.0% |

| | | | | | |
|---|---|---|---|---|---|
| 100-110% (n=260) | Mean | $60,496 | $50,451 | $38,174 | 59.4% |
| | Median | $64,102 | $51,965 | $39,688 | 61.5% |
| | Std. Deviation | $11,671 | $5,358 | $5,358 | 8.4% |
| | 25th Percentile | $62,704 | $47,969 | $35,692 | 55.2% |
| 110-120% (n=1967) | Mean | $67,685 | $55,366 | $43,089 | 60.9% |
| | Median | $70,857 | $54,925 | $42,648 | 60.8% |
| | Std. Deviation | $11,371 | $5,822 | $5,822 | 8.1% |
| | 25th Percentile | $69,602 | $51,782 | $39,505 | 54.9% |
| >120% (n=1492) | Mean | $120,621 | $86,079 | $73,802 | 59.7% |
| | Median | $99,202 | $72,609 | $60,332 | 61.2% |
| | Std. Deviation | $102,654 | $56,032 | $56,032 | 8.3% |
| | 25th Percentile | $81,100 | $63,549 | $51,272 | 55.3% |
| Total (n=7812) | Mean | $47,146 | $41,466 | $29,189 | 56.7% |
| | Median | $34,056 | $34,935 | $22,658 | 60.3% |
| | Std. Deviation | $58,947 | $34,801 | $34,801 | 23.1% |
| | 25th Percentile | $19,000 | $26,220 | $13,943 | 50.0% |

| Table 4: Comparison of Affordable and Convention Multifamily Properties | Affordable | Conventional | Sig. |
|---|---|---|---|
| LIHTC, pct of properties | 59.4 | 0.4 | .000 |
| Journey to Work and Transit Options (2000 Census tracts, pct of workforce) | | | |
| Drove Alone | 71.7 | 65.6 | .000 |
| Any Transit | 8.0 | 14.5 | .000 |
| Walk | 4.3 | 5.3 | .000 |
| Bike | 0.5 | 0.9 | .000 |
| Streetcar or trolley | 0.1 | 0.2 | .000 |
| Subway or elevated | 2.5 | 6.2 | .000 |
| Bus or trolley | 4.8 | 6.9 | .000 |
| Railroad | 0.3 | 0.7 | .000 |
| Fixed rail transit station < 2,500 ft., % of properties | 9.7 | 20.1 | .000 |
| Fixed rail transit station < 1,500 ft., % of properties | 7.2 | 14.8 | .000 |
| No cars, pct of 2 worker households in Census tract | 6.4 | 10.0 | .000 |
| 1 car, pct of 2 worker households in Census tract | 18.1 | 21.2 | .000 |
| Mean travel time, minutes | 24.9 | 27.2 | .000 |
| Mean travel time (where any transit <7%) | 23.4 | 24.1 | .000 |
| Local Accessibility | | | |
| Mean Walk Score for property, 2012 | 54 | 69 | .000 |
| | | | |
| | | | |
| | | | |
| Neighborhood Socioeconomic Conditions | | | |
| Median household income ($), 2000 Census tract | 38,767 | 43,520 | .000 |
| % of individuals below poverty line, 2000 Census tract | 17.3 | 15.3 | .000 |
| % of households below poverty line, 2000 Census tract | 5.4 | 4.7 | .000 |
| Pct of 10-14 year olds in school, 2008-12 Census tracts | 98.4 | 98.4 | .529 |
| Pct of these attending private school | 9.8 | 15.4 | .000 |
| Pct of 15-17 year olds in school, 2008-12 Census tracts | 95.6 | 96.2 | ..002 |
| Pct of these attending private school | 8.7 | 14.3 | .000 |
| Pct of 18-19 year olds in school, 2008-12 Census tracts | 66.0 | 72.0 | .000 |
| Pct of these attending private school | 13.9 | 17.9 | .000 |
| Safety | | | |
| Mean total crimes per 100,000, city, 2010 | 5493 | 4528 | .000 |
| Mean property crimes per 100,000, city, 2010 | 4731 | 3896 | .000 |
| Mean violent crimes per 100,000, city, 2010 | 753 | 658 | .000 |
| Environmental Conditions | | | |
| Protected open space within 1 mile, % of properties | 50.7 | 75.7 | .000 |
| Protected open space within ½ mile, % of properties | 37.0 | 58.8 | .000 |
| Median meters to protected open space | 1529 | 642 | |
| High flood risk location, % of properties | 5.2 | 2.5 | .000 |
| Closer than 1,000 feet to freeway, % of properties | 5.6 | 5.0 | .094 |
| Property Conditions | | | |
| Mean condition rating, most recent observation | 1.75 | 1.91 | .000 |
| Median age | 18 | 44 | .000 |
| Year built | 1987 | 1963 | .000 |

| Table 5: Comparison of Affordable and Convention Multifamily Properties | Principal City | | | Not Principle City | | |
|---|---|---|---|---|---|---|
| | Affordable | Conventional | Sig. | Affordable | Conventional | Sig. |
| Journey to Work and Transit Options (2000 Census tracts, pct of workforce) | | | | | | |
| Drove Alone | 68.5 | 64.5 | .000 | 76.6 | 67.2 | .000 |
| Any Transit | 9.7 | 14.5 | .000 | 5.5 | 14.4 | .000 |
| Walk | 5.2 | 6.3 | .000 | 2.9 | 3.9 | .000 |
| Bike | 0.7 | 1.1 | .000 | 0.4 | 0.5 | .000 |
| Streetcar or trolley | 0.1 | 0.2 | .000 | 0.0 | .01 | .000 |
| Subway or elevated | 2.8 | 5.3 | .000 | 1.9 | 7.8 | .000 |
| Bus or trolley | 6.0 | 8.0 | .000 | 2.8 | 5.1 | .000 |
| Railroad | 0.2 | 0.4 | .000 | 0.4 | 1.1 | .000 |
| Fixed rail transit station < 2,500 ft., % of properties | 11.5 | 19.5 | .000 | 6.8 | 20.9 | .000 |
| Fixed rail transit station < 1,500 ft., % of properties | 9.2 | 15.1 | .000 | 4.2 | 14.3 | .000 |
| Mean travel time, minutes | 23.9 | 25.6 | .000 | 26.5 | 29.5 | .000 |

| Table 6: Cross tabulation of affordability vs. condition | | Affordable | | Total |
|---|---|---|---|---|
| | | .00 | 1.00 | |
| 1.No substantial concerns observed | Count | 7248 | 1268 | 8516 |
| | % within Affordable | 27.1 | 36.2 | 28.2% |
| 2.Some minor issues noted | Count | 15033 | 1881 | 16914 |
| | % within Affordable | 56.2 | 53.7 | 55.9% |
| 3.Substantial and/or critical issues noted | Count | 4206 | 316 | 4522 |
| | % within Affordable | 15.7 | 9.0 | 15.0% |
| 4.Overall condition showing signs of deterioration | Count | 214 | 31 | 245 |
| | % within Affordable | 0.8% | 0.9 | 0.8% |
| 5.Severe deferred maintenance observed | Count | 37 | 9 | 46 |
| | % within Affordable | 0.1% | 0.3% | 0.2% |
| Total | Count | 26738 | 3505 | 30243 |
| | % within Affordable | 100.0% | 100.0% | 100.0% |

| Table 7: Chi-square tests | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 190.711[a] | 4 | .000 |
| Likelihood Ratio | 197.414 | 4 | .000 |
| Linear-by-Linear Association | 155.257 | 1 | .000 |
| N of Valid Cases | 30243 | | |
| a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.33. | | | |