Use of Alternative Data to Supplement Low- and Moderate-Income Summary Data in the Community Development Block Grant Program

U.S. Department of Housing and Urban Development | Office of Policy Development and Research

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Prepared by
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Introduction

Community Development Block Grant (CDBG) activities intended to benefit all residents of a particular area meet the requirements of the program's primary national objective, "[to] benefit to low- and moderate-income (LMI) persons," if at least 51 percent of those residents are classified as LMI. Grantees currently may demonstrate compliance with this objective using data from either special tabulations of the American Community Survey (ACS) provided by the U.S. Census Bureau (Census Bureau, hereafter), which the U.S. Department of Housing and Urban Development (HUD) releases as the low- and moderate-income summary data (LMISD), or a locally administered survey of residents of the service area of the CDBG-funded activity. These methods both have notable limitations (GAO, 2016). Local income surveys impose administrative burdens and costs on communities. LMISD, which is updated every 5 years, may not reflect changing economic conditions. Further, LMISD's sample-based estimates may be imprecise, especially for areas with small populations.

The U.S. House of Representatives' Committee on Appropriations directed HUD in House Report 115-237 to "explore the use of administrative data sets to provide an alternative measure of area income for the CDBG program when standard data have large margins of error." In accordance with this directive, this paper discusses several potential alternative methods for determining LMI areas. Specifically, it explores the use of several publicly available administrative datasets and new uses of ACS data that could be used to supplement, challenge, or replace LMISD estimates. Several hypothetical rules for LMI area qualification are applied to real data from the period of 2010 to 2014. The resulting impact of these rules on a specific population of jurisdictions most likely to be affected by the shortcomings of the current data sources, non-entitlement places, is assessed under each option.

This analysis highlights the advantages and disadvantages of such options and suggests a framework for policymakers in evaluating changes to the CDBG program's rules on LMI area determination. Analysis suggests that methods involving administrative datasets likely have too many limitations to be feasible options in the short-term. Administrative datasets suffer from issues of missing data and incomplete geographic coverage. Perhaps more importantly, alternative estimates of economic distress from the administrative datasets show very low levels of correlation with LMI percentage estimates from LMISD. Adopting such measures may thus conflict with statutory intent with its focus on targeting benefits to the LMI population. New uses of ACS data show more promise as supplements to LMISD. One option, which uses standard rather than special tabulations of ACS data, would allow grantees to perform their own calculations in the years between official LMISD releases and produce new estimates to challenge the official estimates. To add stability to such a plan, HUD could require grantees to demonstrate meeting the LMI threshold consistently over a given time period, such as 2 of 3 or 3 of 4 years. Any option that allows for "off-year" ACS estimates to be used to demonstrate eligibility would increase the total pool of places eligible for area benefit activities. While this could be seen as making CDBG less targeted to the communities most in need of assistance, it

would likely alleviate some concerns about the imprecision of ACS estimates by allowing grantees additional opportunities to demonstrate eligibility.

Background

Authorized under Title I of the Housing and Community Development Act of 1974 (HCDA), CDBG is the federal government's flagship community development program with a FY 2018 appropriation of roughly $3.3 billion. The majority of funds are allocated through formula to entitlement communities, generally consisting of metropolitan cities and urban counties, while 30 percent of funding goes to the state CDBG program, which channels funds to non-entitlement communities. All CDBG grantees, entitlement and non-entitlement, must use funding toward one of CDBG's three national objectives: (1) benefit LMI persons, (2) aid in the preservation or elimination of slums or blight, or (3) meet a need having a particular urgency. Benefit to LMI persons is explicitly mentioned to be the primary national objective, as is further evidenced by the fact that at least 70 percent of CDBG funding is to be spent, during a 1-, 2- or 3-year period, on activities intended to meet this objective. Activities may be considered to benefit LMI persons if they:

- Provide an area-wide benefit to an area that is at least 51 percent LMI,
- Serve a limited clientele of LMI persons,
- Involve housing for LMI households, or
- Involve employment for LMI persons.

This paper focuses on the methods grantees use to demonstrate that funded activities fall under the first category, which HUD refers to as LMI area benefit activities. An area benefit activity is one in which *all* residents of an area, which must be primarily residential, may potentially receive benefits from the activity. Projects involving improvements to water or sewer systems, parks, sidewalks, and community centers are examples of activities that might fall under this category. An important first step in determining whether or not an activity qualifies under the LMI area benefit standard is the determination of the geographic area served by the activity. HUD gives maximum deference to grantees in defining service areas; however, they are expected to be reflective of the nature and location of the activity.

Once a service area's boundaries are determined, grantees must demonstrate that at least 51 percent of residents in that area are LMI. HUD allows two general methods for measuring the percentage of LMI persons. The grantee may cite the estimated percentage of LMI persons included in the HUD-provided LMISD based on the most recently available Census Bureau survey (decennial census prior to 2014 or ACS thereafter), or it may conduct a methodologically sound local survey of incomes, which can be used to estimate the percentage of LMI persons. The codified definition of LMI persons is discussed in more detail in the next section. Program guidance stipulates that HUD-provided LMISD data should be used to the fullest extent feasible. There are several situations in which grantees may need to conduct a local income survey. For example, a survey may be necessary when a proposed activity's service area does not align closely with the boundaries of the Census Bureau geographies for which data are available in the

LMISD, such as block group, tract, or place. Grantees may also use a survey if they believe that LMISD estimates are not current or are otherwise inaccurate. As discussed in more detail in the next section, the relatively small sample sizes on which LMISD estimates are based can result in estimates with large margins of error and, therefore, low levels of statistical certainty that the estimates reflect the true characteristics of an area.

Low- and Moderate-Income Summary Data

LMISD in its most basic form consists of an estimate of the count of persons considered LMI according to program definitions, as well as an estimate of the total person count, in an area. These two estimates can be used to calculate an area's percentage of LMI persons. Count estimates can be added together to generate LMI estimates for areas that combined multiple geographic areas for which data are available.

An LMI person is defined by Section 102(a)(20) of the HCDA as a person in a family or an individual with annual income equal to or less than HUD's Section 8 Low Income Limit, which is generally 80 percent of an area's median family income adjusted for household size. For the state CDBG program, the 80-percent limit for areas in non-metropolitan counties is calculated as 80 percent of the greater of non-metropolitan statewide median or the county median income. In metropolitan counties, the median income of the metropolitan area is used to calculate the limit. Separate limits are defined for each family size. For the purposes of CDBG, the income limit adjusted for family size is applied to each household within the ACS sample according to the number of family members.

HUD has long produced and distributed "low-mod" income data for the purpose of assisting grantees in determining whether areas qualify for LMI area benefit activities. The way in which these estimates are produced, however, has changed over the life of the program to reflect statutory and regulatory changes as well as changes to the type of Census Bureau data available for program use. The replacement of the sample-based "long form" decennial census by the ACS as the source of income data necessitated critical changes in the policy and data practices. The final long form census sample was drawn from the 2000 decennial census, and ACS data collection began in 2005.

Currently, LMISD is a Census Bureau-produced special tabulation of ACS 5-year estimates, calculated from ACS microdata from a sample drawn over a 60-month period. "Special tabulations" are estimates based on custom user-defined definitions or geographies. They differ from ACS's "standard tables" that produce estimates using the Census Bureau's common definitions and geographies and are publicly available. The LMISD special tabulation relies on the Section 8 Low Income Limits that HUD provides the Census Bureau to categorize families and individuals as either LMI or not. Because they have the largest sample size of all ACS products, 5-year estimates are the most reliable survey data currently available for the LMISD, although sample sizes are still smaller, and margins of error larger, than what the long-form decennial census offered. Immediately prior to the launch of the ACS and its adoption as the

source of LMISD estimates starting in 2014, LMISD estimates were based on the long-form 2000 decennial census sample, drawn in a single census year, and were set in place for a 10-year period. Unlike the current LMISD estimates, which are special tabulations, the census 2000-based LMISD were calculated from standard tables using an algorithm established by HUD several decades prior. The specific procedure is discussed in more detail below and replicated using current ACS data.

In the earliest years of the state CDBG program, states were able to establish their own definitions of low and moderate income. The Housing and Urban-Rural Recovery Act of 1983 codified the current standardized definition of LMI to be income equal to or below the Section 8 Low Income Limit. HUD began to provide guidance on the use of LMI data related to area benefit activities in 1983 (Dodge, 1983), and it explicitly applied the guidance to the State CDBG program in 1984 (Bollinger, 1984). This guidance instructed grantees on the method by which the percentage of LMI persons for a specified area could be calculated using Census Bureau data on income and average family size and HUD's Section 8 Income Limits. The basic procedure was to calculate the number of LMI persons in families by multiplying the average number of persons per family by the number of LMI families, which could be obtained by aggregating the estimated number of families below the size-adjusted Section 8 Income Limit for the area in question in the family income distribution table available from the Census Bureau. This number would then be added to the number of LMI "unrelated individuals" in the area, which could be similarly obtained from another census table after applying a size-adjusted income limit. The total LMI persons could be divided by the total population of the area to get the LMI percentage. In 1983, HUD calculated the number and percentage of LMI persons at the census-tract and block-group levels for the entire nation and distributed the data to HUD field offices to be made available to grantees by request. This method was employed in similar form with census 2000 data. The 1990s saw the first use of special tabulations of LMI persons provided to HUD by the Census Bureau, a method that was again employed starting in 2014, except that it then began to use ACS data rather than decennial census estimates.

The analytical section of this paper explores the effects of either reverting to previously used methods of LMI calculation or using estimates from such methods as alternative measures of LMI percentages for the purposes of qualifying for area benefit activities. Further, policy changes that allow for the use of special tabulation data from ACS to be used in new ways are also explored. Hypothetical area benefit rules that employ both special tabulation estimates and estimates drawn from standard income and family size tables are included in the analysis and discussion later. A third, simplified method of LMI calculation using census estimates was also used in the 1980s, as first suggested in a January 23, 1984, HUD memorandum (Dodge, 1984). The memorandum recommended that grantees that "do not have the capacity to carry out all the computation involved (in the standard procedure)" should "simply compare the relationship of the area's 1980 Median Family Income to the derived four person limit for the metropolitan statistical area (MSA) or non-metropolitan county in which it is located." Non-family median incomes could similarly be compared to an adjusted one-person limit. If both medians were

lower than the appropriate limits, the area could be considered to be at least 51 percent LMI. If only one comparison met the standard, the more involved standard table calculation described earlier would need to be employed. The simple median comparison method is also tested and discussed in more detail later.

Like all survey-based estimates, ACS estimates are uncertain to some degree due to the nature of random sampling, and the Census Bureau now provides margins of error (MOEs) for all estimates. Roughly speaking, MOEs can be used to calculate a confidence interval around an estimate such that users can have a specific level of confidence that the true population count will lie somewhere within the interval. The Census Bureau uses a 90-percent confidence level as its standard. Large MOEs reduce the confidence one has in the accuracy of point estimates. MOEs tend to be larger for small samples, and, as a result, ACS estimates for geographic areas with small populations may be imprecise. This places a limit on how small of a geographic area for which the Census Bureau will produce estimates. Currently, the smallest geography for which ACS 5-year estimates and LMISD are produced is the block group. The larger sample size of the long form decennial census allowed for estimates at the smaller split-block group level.

After the transition to ACS-based estimates, HUD has elected to release LMISD estimates every 5 years. The most recent LMISD release occurred in early 2019. It uses 2015 5-year ACS data, and replaces the 2006–2010 ACS-based LMISD. Although the Census Bureau provides HUD with the special tabulations on which LMISD is based annually, the policy of updating the publicly available data every 5 years had several motivations. First, it increased the frequency of updates from the decennial census-based LMISD, thus offering estimates based on more recent data in most years. Second, a 5-year schedule aligns with the time frame of local consolidated plans. Third, the policy results in non-overlapping 5-year ACS samples being used for LMISD. If LMISD were updated annually with the most recent 5-year ACS sample, only 20 percent of the sample would change from year to year. The Census Bureau advises against making comparisons between estimates based on 5-year samples that overlap. Finally, the policy was intended to offer increased stability of LMI status, which is beneficial for jurisdictions' long-term planning efforts. More frequent updates, which could see areas flipping in and out of LMI area benefit eligibility, would make planning for long-term projects less certain.

To provide flexibility to grantees, HUD offers LMISD estimates at several geographic levels. Data are provided at the block group and local government levels, which could be a place, county, or remainder of county after excluding one or more places. Block group data can easily be aggregated to census tract or county level. Block group is generally the smallest geographic unit available, generally consisting of between 600 and 3,000 people, although there are many instances of places smaller than surrounding block groups, especially in non-metropolitan areas. Because CDBG activities in small municipalities are often delivered at the municipal level, the analysis in this paper is performed on place-level data. These places often have LMISD estimates with large MOEs and, thus, less precise measures of LMI status under current rules. These places

also may have less capacity to undertake a local income survey in those cases where they want to challenge LMISD estimates.

Limitations of Low- and Moderate-Income Summary Data

While LMISD has many strengths, including wide geographic coverage, ease of use, and rigorous survey and data standards, the dataset has several important limitations that reduce its usefulness to some grantees.

- Precision of estimates: Estimates often have large margins of error, especially for small population areas. Many jurisdictions may not qualify as LMI simply due to chance inherent in random sampling. Likewise, many areas that meet the LMI threshold only do so due to chance.
- Geography: Service areas may not be aligned with available Census Bureau geographies or may be only a small portion of an available geography.
- Recency: Reliance on the 5-year sample, generally only available 3 years after the most recent ACS collection year, and the policy of locking in LMISD for 5-year periods means that estimates may not reflect current economic conditions.

The only recourse for grantees that either disagree with LMI eligibility determination or cannot use LMISD in determining the qualification of an LMI benefit area is to conduct a local income survey. These surveys are required to meet standards of statistical reliability comparable to that of the ACS for areas of similar size (HUD, 2014). As such, grantees are required to clearly document the survey methodology employed and to use a random sampling process. Local income surveys have their own limitations. Many grantees lack the knowledge or capacity to conduct and analyze data from a methodologically rigorous survey. A GAO study that involved interviews of grantees on this subject found that surveys can be time-consuming and expensive to implement (GAO, 2016). Several study participants reported difficulty in getting survey respondents to disclose information on income.

HUD does not specifically collect information on the number of local income surveys being conducted; however, such surveys are often used in the state CDBG program to meet LMI area benefit eligibility standards. In some states, the vast majority of CDBG area benefit activities are justified using local survey data. In fact, according to a GAO study, at least one state found the limitations of LMISD to be problematic enough to disallow the use of it in determining LMI eligibility (GAO, 2016).

Potential Alternative Data Sources and Policies

Congress directed HUD to explore the use of administrative data sets that may provide alternative measures of area income for the purposes of CDBG (U.S. Congress, 2017). The alternative sources must conform with the statutory intent of the program while also addressing some of the limitations of LMISD. HUD also may consider policy changes in the use of existing LMISD to address the concerns of grantees and stakeholders. This section will examine the use

of several administrative data sets and policy changes regarding the use of existing LMISD. These alternatives can be grouped as follows:

- Expanded use of ACS data
    A. "Off-year" LMISD
    B. Standard table derived estimates (both family-size-adjusted and simplified methods)
- Use of federal income tax data
    C. Average adjusted gross income per return
    D. Proportion of returns claiming Earned Income Tax Credit (EITC)
- Use of broader measures of economic distress as proxies for LMI measures
    E. Home price indices from the Federal Housing Finance Agency
    F. Residential vacancy rates from the U.S. Postal Service
    G. Jobs per capita from the Census Bureau's Longitudinal Employer-Household Dynamics program

Estimates from the LMISD, released on an every-fifth-year schedule, will likely continue to serve as the standard measure of area LMI percentage. Alternative datasets and policies could be used to challenge LMISD estimates or allow for areas to qualify as LMI outside of the 5-year lock-in period when economic conditions change rapidly. Metrics based on the alternative datasets could be used as standalone thresholds for qualification or as one stage of a multi-part test that includes current policy and the existing LMISD. For example, HUD could establish a rule under which an area would qualify for LMI area benefit activities if the residential vacancy rate exceeded some threshold related to its metropolitan area's vacancy rate. Alternatively, the rule could be that an area would first need to show, using LMISD, that the confidence interval around the estimate of LMI percentage includes the 51-percent threshold, thereby demonstrating that there is no strong statistical evidence that the true LMI rate falls below the standard, and then qualifying using the vacancy test. Later analysis will explore these options.

The following subsections discuss each alternative data source and potential policy change. First, the dataset is described in detail, including its source and collection, issues related to missing data, and any calculation or transformation that is needed to get the data into the geographic level of interest. The limitations of the dataset are then discussed. For each alternative data source, several potential metrics for establishing LMI eligibility are presented. In each case, a specific threshold is established by which eligibility would be determined. In some cases, a rule involves meeting a simple threshold, such as having an estimated percent LMI population greater than or equal to 51 percent in a given year, but a rule also could involve needing to meet a standard a specified number of times in a given period, such as at least 2 of 3 or 3 of 4 years. A required minimum number of years meeting a threshold over a specified period would not be unprecedented, as it would be similar to the rule employed in the determination of Qualified Census Tracts (QCTs) for the purposes of the Low-Income Housing Tax Credit (LIHTC) program. The QCT rule requires that census data show that at least 50 percent of a tract's households have income less than 60 percent of the area median gross income or a poverty rate

of at least 25 percent in 2 of 3 years. The "2 of 3 years" condition is justified on the grounds of "potential statistical anomalies in the ACS 5-year estimates" (HUD, 2017). Additional conditions provide for narrower targeting of need by setting more restrictive standards and may result in increased stability relative rules with less conditions.

In the analysis below, the relevant threshold is often set as 80 percent or 125 percent of a comparison area's median on some measure, depending on whether the measure in question is a positive (for example, income) or negative (for example, vacancy) economic characteristic of a community. Such adjustments are made to roughly align with the existing standard of the Section 8 Income Limit, which is 80 percent of the area median income.

The aggregate effects of all potential options are evaluated using available data. All analysis is restricted to non-entitlement places, although similar policy changes could hypothetically be made with regard to the entitlement program and other levels of geography. Such analysis provides proof of concept in terms of demonstrating the ability to use the different datasets and shows how expansive such changes could be in terms of increased numbers of eligible places. Unless otherwise noted, analysis focuses on the effect of employing a new rule and/or dataset *in addition to* the existing rule that relies on 5-year LMISD, such that the new rule would allow for the qualification of additional places while maintaining status of places that already qualify under the current rules and use of the current LMISD.

Expanded Use of American Community Survey Data—"Off-Year" Low- and Moderate-Income Summary Data

The Census Bureau provides HUD with 5-year special tabulations of ACS annually, although they are only publicly released as the LMISD every fifth year. The Census Bureau generally advises against making year-to-year comparisons between 5-year ACS estimates drawn from samples with overlapping years. Each year's new 5-year ACS estimates are based on a sample that overlaps 4 years with the previous 5-year ACS's sample. For example, the samples on which ACS 2010–2014 and ACS 2009–2013 differ only in that the 2014 sample is added, and the 2009 sample dropped for ACS 2010–2014; samples from 2010 to 2013 are used in the calculation of estimates in both releases. Thus, year-to-year changes are driven by a relatively small sample of households, as well as any changes to weighting procedures or other methodological factors employed by the Census Bureau in calculating estimates. Each release of 5-year ACS, however, represents the best estimate of population characteristics given the available data each year. Therefore, it seems appropriate to consider each year's ACS estimates as valid and potentially useful for program qualification.

LMI area benefit qualification relying on "off-year" LMISD estimates could take several forms. These data are attractive for several reasons. They are available at all geographies of interest. The source of the data is trusted, and access to it is reliable. Processes for managing and analyzing the data are already established.

Areas potentially could qualify based on the following rules that rely on off-year LMISD, listed in order of increasing restrictiveness:

A1. Any estimate of at least 51 percent LMI in any year between regular LMISD releases.
A2. Estimates of at least 51 percent LMI in at least 2 of 3 years.
A3. Estimates of at least 51 percent LMI in at least 3 of 4 years.
A4. Any estimate with a confidence interval that is above the 51-percent threshold in any year between regular LMISD releases.

Under option A1, a place or other unit of geography would qualify for area benefit activities if its estimated LMI percentage meets or exceeds the 51-percent threshold in any off-year special tabulation. Under the current policy, LMISD is released every 5 years, meaning that areas would have four opportunities between official releases to qualify. Options A2 and A3 add conditions related to the frequency of meeting the standard. A similar rule is applied in the eligibility determination of QCTs for the purposes of LIHTC. Such rules decrease the chances that places with anomalous estimates, due to random sampling, in a single year are excluded from eligibility when their estimates are much lower than surrounding years. The final option is the most restrictive because it only includes those estimates that are significantly greater than the 51-percent standard in a statistical sense. Because of the wide confidence intervals around estimates for small geographies, these types of estimates are relatively rarely observed in the data. When they do appear, they provide strong evidence that the true percentage of LMI persons in the area is above 51 percent. Because the magnitude of margin of error is negatively correlated with the population of an area, however, such a rule may be biased against low-population areas that are less likely to show the entire confidence interval above 51 percent. Exhibit 1 demonstrates the issue by displaying the percentages of places with margins of error of at least 25 percentage points by the population of the place. Because a confidence interval is twice the margin of error, any place with an MOE of 25 percentage points or more would be effectively excluded from qualifying under option A4.

Exhibit 1. Percentage of Places with Margins of Error for the Estimated LMI Percentage of at Least 25 Percentage Points by Low- and Moderate-Income Universe (Population)—2010

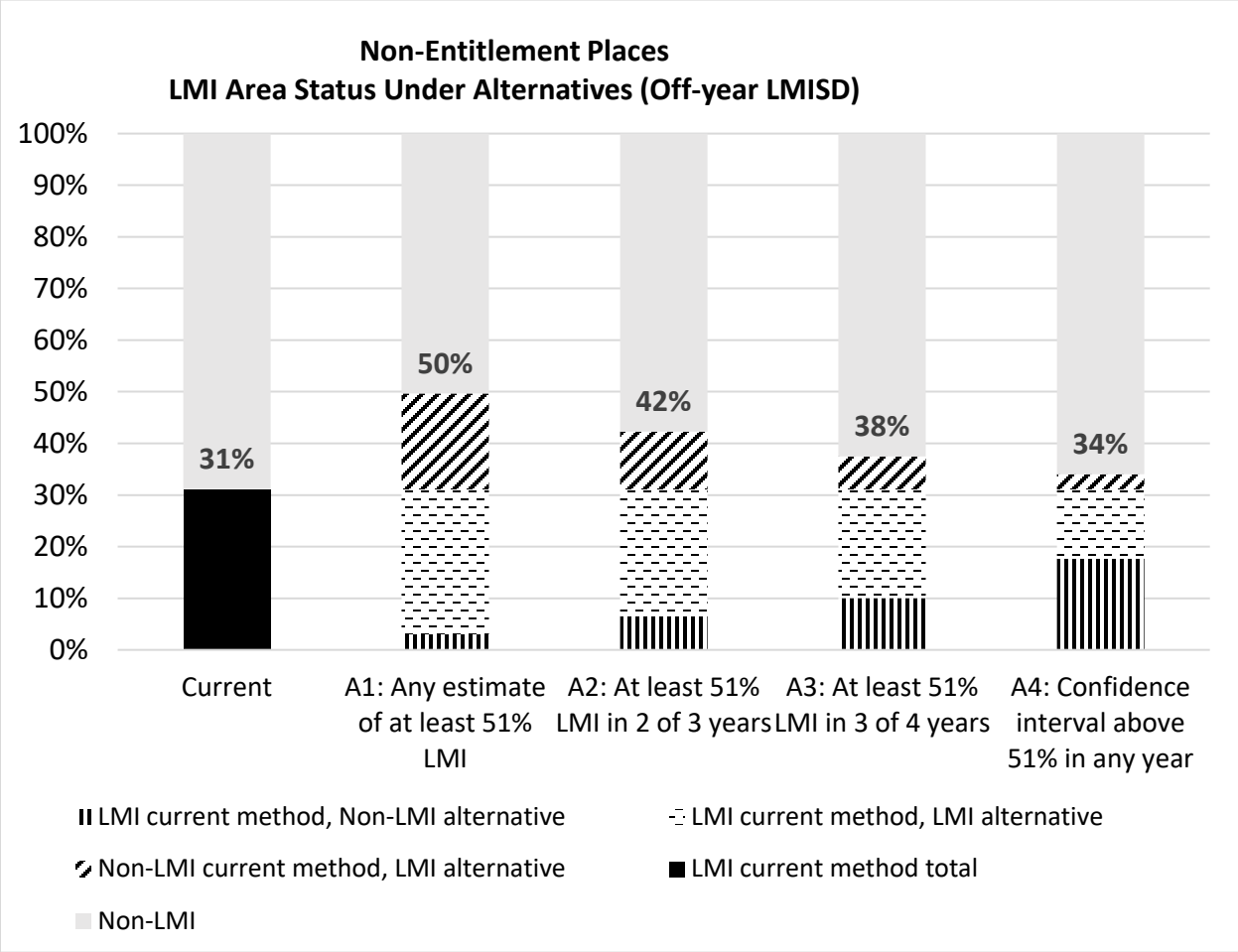
Low- and Moderate-Income Universe (2010)	LMI% MOE >= 25 Percentage Points (2010)
0-100	74%
101-500	26%
501-1000	7%
1,001-4,000	1%
Greater than 4,000	0%
Total	16%

LMI = low- to moderate-income. MOE = margin of error.

Exhibit 2 displays the results of the application of these rules over ACS years 2010 to 2014. Under the current rule using ACS 2010 data, 7,769, or roughly 31 percent, of 24,929 non-entitlement places qualify as LMI areas. Under option A1, an additional 4,631 places would qualify through 2014. Another 21 places that did not exist at the time of the 2010 LMISD would also be able to qualify. This highlights one potential benefit of off-year LMISD in that newly formed jurisdictions would have a way to qualify for CDBG area benefit activities at an earlier time. Roughly 50 percent of non-entitlement places would eventually qualify as LMI under option A1. Exhibit 2 highlights the fact that the majority of places that meet the conditions of option A1 already qualify under the existing rule.

Under options A2 and A3, an additional 2,800 and 1,610 places, respectively, would qualify as LMI areas by the fourth year following the release of the 2006–2010 LMISD. This analysis only considers ACS datasets released subsequent to 2006–2010, so additional places would likely qualify under options A2 and A3 if earlier ACS releases were also considered. These would be cases in which the estimated LMI percent fell below the 51-percent threshold in the 2006–2010 data but was above that standard in years prior to and subsequent to that year. Again, most places meeting the conditions of the proposed rules already qualify. The final option, A4, results in only 740 additional qualified places. Places that qualify under option A4 may have the strongest case to argue that their true percentage of LMI persons meets the existing CDBG area benefit criterion. Census confidence intervals are based on 90-percent confidence levels, meaning that there is a 10-percent chance that the true population measure falls outside of the confidence interval, however. Therefore, no place can demonstrate with absolute certainty that at least 51 percent of its residents are LMI using ACS-based estimates. The most common category of place under option A4 is that it qualified under current rules but would not meet the conditions of option A4. This demonstrates the fact that many places currently qualify for area benefit activities through LMISD that have estimated LMI percentages that are not statistically above the 51-percent threshold.

Exhibit 2. Proportion of Jurisdictions Qualifying as LMI under Current and Proposed Rules over Years 2010 to 2014—Off-Year ACS Data



ACS = American Community Survey. LMI = low- to moderate-income. LMISD = low- and moderate-income summary data.

Expanded Use of American Community Survey Data—Standard Table Derived Estimates (Size-Adjusted and Simplified Methods)

As discussed in a previous section, there have been times throughout the history of the CDBG program that special census tabulations have not been available and calculations of LMI percentages were based on the standard tables produced by the Census Bureau. The 1980s and 2000s saw the use of such methods, whereby decennial census estimates of family and non-family individual income distributions were combined with Section 8 Income Limits to produce estimated counts of LMI persons. The necessary tables to perform such a method are currently produced for ACS data, and such a method could be used to either replace or supplement the special tabulation LMISD in the future. Reliance on standard tables would have several benefits: (1) data may become available earlier than with special tabulations, (2) costs could be reduced, in terms of staff time and the remuneration HUD pays the Census Bureau to produce the special tabulations, and (3) grantees would be able to do their own calculations. There are several

downsides, however: (1) accuracy of estimates would be decreased, relative to the special tabulations based on ACS microdata, and (2) margins of error would not be available.

The following steps are employed in the more complex, size-adjusted calculation process:

1. The average household sizes of families and non-families are calculated from the ACS tables B11001 and B11002 (all fractions are rounded up to the next integer);
2. The area's Section 8 income limit is selected to correspond with the average household sizes calculated in step 1. For example, if the average family household in an area includes five persons, the five-person income limit would be used;
3. The number of families and non-families that fall below their respective adjusted income limits are determined from the family and non-family household income distribution tables (B19101 and B19201). When a limit falls within the range of an income category, the percentage of the range below the limit is calculated and that percentage is multiplied by the estimated count of households in that category;
4. The estimated numbers of LMI families and non-families are multiplied by the average household size for families and non-families, respectively, to get the number of LMI persons in families and non-families;
5. Those estimates are summed to get the total count of LMI persons; and
6. The LMI percentage is calculated by dividing the number LMI persons by the total population of the area.

A second, simplified method of LMI estimation was suggested to grantees in past decades. This method simply compares the median family income of an area to the Section 8 four-person income limit and the median non-family individual income to the one-person income limit. If both comparisons showed the area medians to be lower than the respective income limits, the area was considered to meet the LMI area threshold. Such a method is also feasible using current ACS-based estimates and may be the most readily comprehensible comparison as well as the most efficient to produce. It does not require the use of multiple tables or summing across income categories. Rather, it simply involves the comparison of one number, the median income estimate, to another number, the relevant income limit. The tradeoff for these benefits is that the precision of the estimates may be further reduced. Evaluation of such a method would also have to consider the fairness of a method that may overcount LMI persons in areas with average family sizes below four while undercounting them in areas with average family sizes above four.

Estimates of LMI percentage produced by these methods and data sources could be used in a number of qualification rules that would supplement the existing LMISD. Eligibility could be extended to places if they can show:

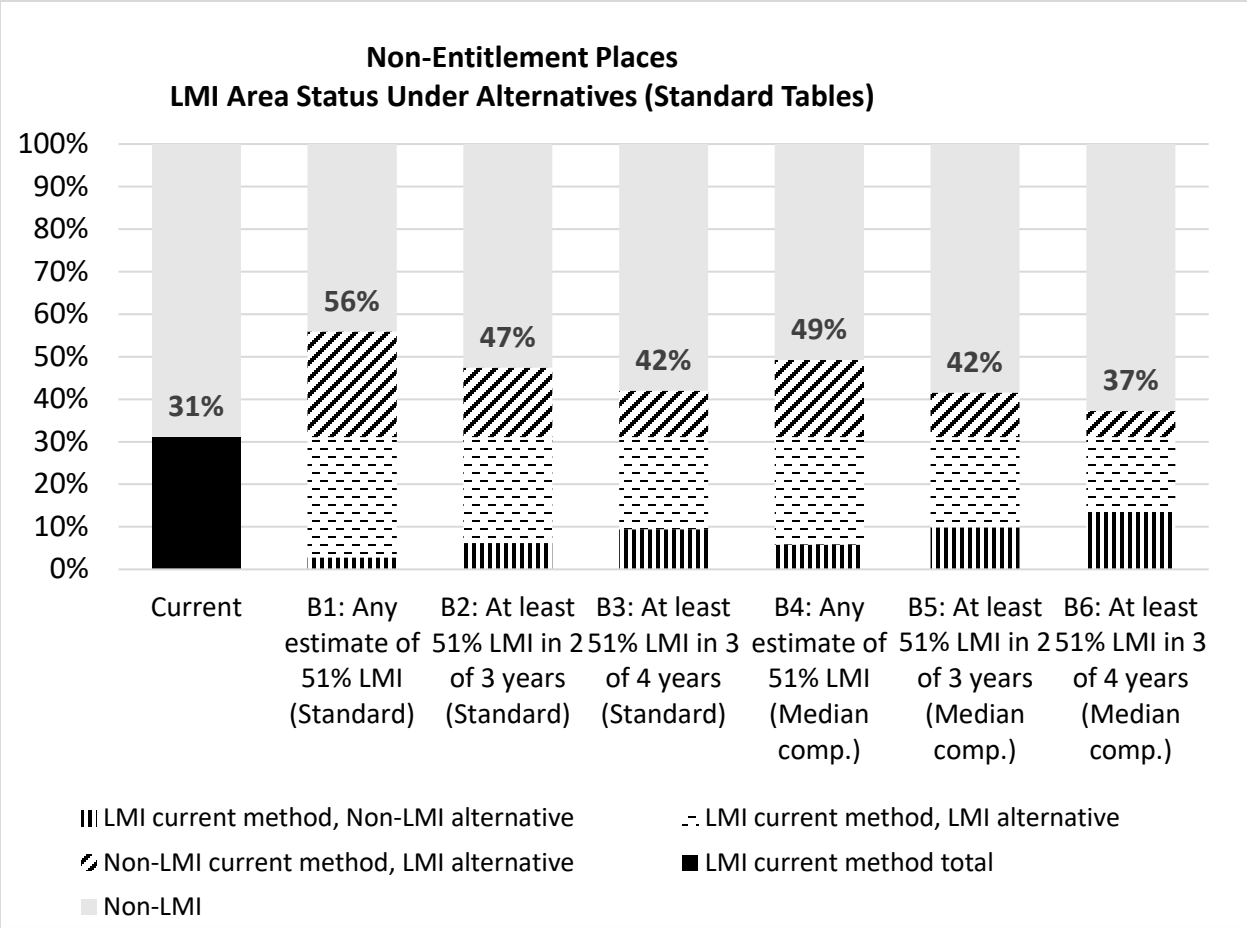
B1. Any estimate of at least 51 percent LMI in any year using size-adjusted method,
B2. Estimates of at least 51 percent LMI in at least 2 of 3 years using size-adjusted method,
B3. Estimates of at least 51 percent LMI in at least 3 of 4 years using size-adjusted method,
B4. Any estimate of at least 51 percent LMI in any year using simple median comparison method,
B5. Estimates of at least 51 percent LMI in at least 2 of 3 years using simple median comparison method, and
B6. Estimates of at least 51 percent LMI in at least 3 of 4 years using simple median comparison method.

ACS 5-year estimates for all non-entitlement places from 2010 to 2014 are used in the following analysis.

As shown in Exhibit 3, the relevant benchmark for comparison of the effects of these options is again the current percentage of places that qualify as LMI areas using the special tabulation-based LMISD, which is 7,769 or roughly 31 percent. Under option B1, the least restrictive rule because it allows an estimate of over 51 percent LMI in any year to qualify as an LMI area, 6,212 additional places would qualify, resulting in 56 percent of non-entitlement places being eligible for area benefit activities. A majority of places that would qualify under B1 already meet the LMI standard using special tabulation LMISD from the 2006–2010 ACS. The correlation between LMI percentage estimates from the ACS standard and special tabulations is displayed in appendix B. Options B2 and B3 would result in an additional 4,086 and 2,728 qualified places, respectively, and either 47 or 42 percent of non-entitlement places meeting the LMI threshold.

Option B4, which relies on estimates from the simple, median income comparison method, results in 4,545 additionally qualifying places or 49 percent of total places. Options B5 and B6, which require the standard to be met in either 2 or 3 or 3 or 4 years, reduce the number of qualified places to 42 and 37 percent as a result of the 2,626 and 1,555 new places that would qualify under these rules. In all cases, the simplified method results in fewer qualified places relative to the family size-adjusted method.

Exhibit 3. Proportion of Jurisdictions Qualifying as LMI under Current and Proposed Rules over Years 2010 to 2014—Standard Table ACS Data



ACS = American Community Survey. LMI = low- to moderate-income.

The earlier analysis is based on the idea that standard table LMI estimates would be employed in addition to the current special tabulation-based approach as a supplemental option for determining eligibility. It is interesting to also consider the effect of using the standard table methods as a replacement for the current approach. Exhibits 4 and 5 show what would have been the outcome if standard table ACS 2006–2010 data were used, either with the complex or simple (median income comparison) LMI calculation method, in place of the ACS 2006–2010 special tabulation data that were used. Exhibit 4 shows that slightly more non-entitlement places would qualify using the alternative data (33 percent versus 31 percent). Most places that qualified using the current data would also qualify using the alternative method. The estimates are not perfectly correlated, however, as many places qualify using one method but not the other. The correlation between the two LMI percentage estimates of LMI status is 0.78, which indicates a high degree of similarity, and in roughly 84 percent of cases, the two methods produce the same eligibility determination. This is not terribly surprising because the estimates are drawn from the same underlying data. The special tabulation LMISD is likely more precise as it applies to size-

adjusted income limits to all households in the microdata rather than deriving estimates from income limits applied to categorical counts of households in the income distribution.

Exhibit 5 shows the results of applying the simple calculation of LMI status that rely on a comparison of the median family income of an area to the area's Section 8 four-person income limit and the median non-family income of the area to the area's Section 8 one-person limit. Both medians must be below their respective limits to qualify as LMI under this scenario. In this case, less non-entitlement places would qualify using the alternative method (25 percent versus 31 percent). Although there is no continuous estimate from the simple method with which to calculate a correlation with the estimate from the current LMISD, the table shows that again about 84 percent of cases result in the same eligibility outcome.

Exhibit 4. Cross-tabulation of LMI Qualifying Places using ACS 2006–2010 Special Tabulations or Standard Tables (Family Size-Adjusted Method)

	Standard Table (ACS 2006-2010)—Family Size-Adjusted Method—LMI Area			
Special Tabulation (ACS 2006–2010)—LMI Area	**No**	**Yes**	**Total**	**Percent**
No	14,990	2,247	17,237	69%
Yes	1,639	6,130	7,769	31%
Total	16,629	8,377		
Percent	67%	33%		

ACS = American Community Survey. LMI = low- to moderate-income.

Exhibit 5. Cross-Tabulation of LMI Qualifying Places using ACS 2006–2010 Special Tabulations or Standard Tables (Simple Method)

	Standard Table (ACS 2006–2010)—Simple Method—LMI Area			
Special Tabulation (ACS 2006–2010)—LMI Area	**No**	**Yes**	**Total**	**Percent**
No	15,954	1,283	17,237	69%
Yes	2,798	4,971	7,769	31%
Total	18,752	6,254		
Percent	75%	25%		

ACS = American Community Survey. LMI = low- to moderate-income.

Use of Federal Income Tax Data

The Internal Revenue Service (IRS), through its Statistics of Income (SOI) program, produces annual summary data on federal individual income tax returns at the county and ZIP-Code levels. The data can be used to compare areas across several tax-related metrics. This analysis focuses on two such metrics, average adjusted gross income (AGI) and the percentage of returns that claim EITC, but there are several additional measures of income and credit take-up that could

also be used. AGI represents a tax filer's total income minus certain deductions but before itemized or standard deductions and personal exemptions are subtracted. EITC is a credit for LMI working households. The maximum income to qualify for the tax credit depends on household composition with AGI limit of $54,844 for a married filing jointly household with three or more children in tax year 2018. A single, head of household, or widowed household with no children could earn up to $15,270 in tax year 2016 and claim EITC. Households with qualifying children can earn significantly more and claim EITC, up to $55,952 in household AGI in the case of a married couple with three or more children that files jointly.

IRS data must be transformed to the place level, the geography of interest in this analysis, using weighted averaging of estimates from intersecting ZIP Code Tabulation Areas (ZCTAs). The percentage of a place's population within a ZCTA in 2010 is used as the weight. Because tax data are suppressed in some ZCTAs, which will be discussed in more detail shortly, weighted averages may be invalid due to missing data. Therefore, a place is included in analysis only if 90 percent or more of its 2010 population resides in ZCTAs with available tax data. After application of this rule and the exclusion of Puerto Rican places, for which IRS data are not available, up to 10.8 percent of places have missing estimates in a given year.

To measure relative economic distress using income tax-related metrics, a point of comparison is required. This analysis uses a similar rule for comparison as the LMISD. Each place is matched to its assigned HUD Income Limit Area, which generally corresponds to Office of Management and Budget-defined metropolitan statistical area (MSA) or the county for non-metropolitan places. For places within a metropolitan area, the HUD Income Limit Area serves as the comparison area. For places outside of an MSA, the state aggregate non-metropolitan area serves as the comparison. For places that span HUD Income Limits Areas, a weighted average of the areas is used for comparison, with a count of housing units (from 2010 census) within each place-county part serving as the weight. If any part of a place intersects with a non-metropolitan county, the state non-metropolitan aggregate serves as the comparison area. For the rules involving AGI, the relevant point of comparison is 80 percent of the comparison area's average AGI. For EITC-based options, 125 percent of the comparison area's percentage of returns with EITC claims serves as the benchmark of interest. The thresholds are adjusted up and down from the average, depending on whether the variable is negatively or positively correlated with economic distress, to correspond with the current CDBG rule that sets the threshold for LMI status at 80 percent of an area's median family income.

Limitations of the IRS SOI data include:

- Puerto Rico and insular areas are excluded,
- Addresses on returns may differ from taxpayers' actual residences,
- Many individuals are not required to file an individual income tax return,
- Analysis does not control for differences in the composition of return type (for example, single, joint) across areas,

- ZIP Code is not a stable geographic unit; the analysis assumes there is a good match between ZIP Code and ZCTA (as defined by 2010 census),
- ZIPs with less than 100 returns and those identified as a single building are suppressed,
- Income and tax items with less than 20 returns for a particular AGI class are combined with another AGI class within the same ZIP Code,
- The dataset excludes returns with a negative AGI,
- Returns that represent an undisclosed specified percentage of the total of any particular cell are excluded, and
- Not all eligible households claim EITC; this take-up rate may vary across places.

There are several possible metrics based on the SOI that could potentially be employed in the qualification of places as LMI, including:

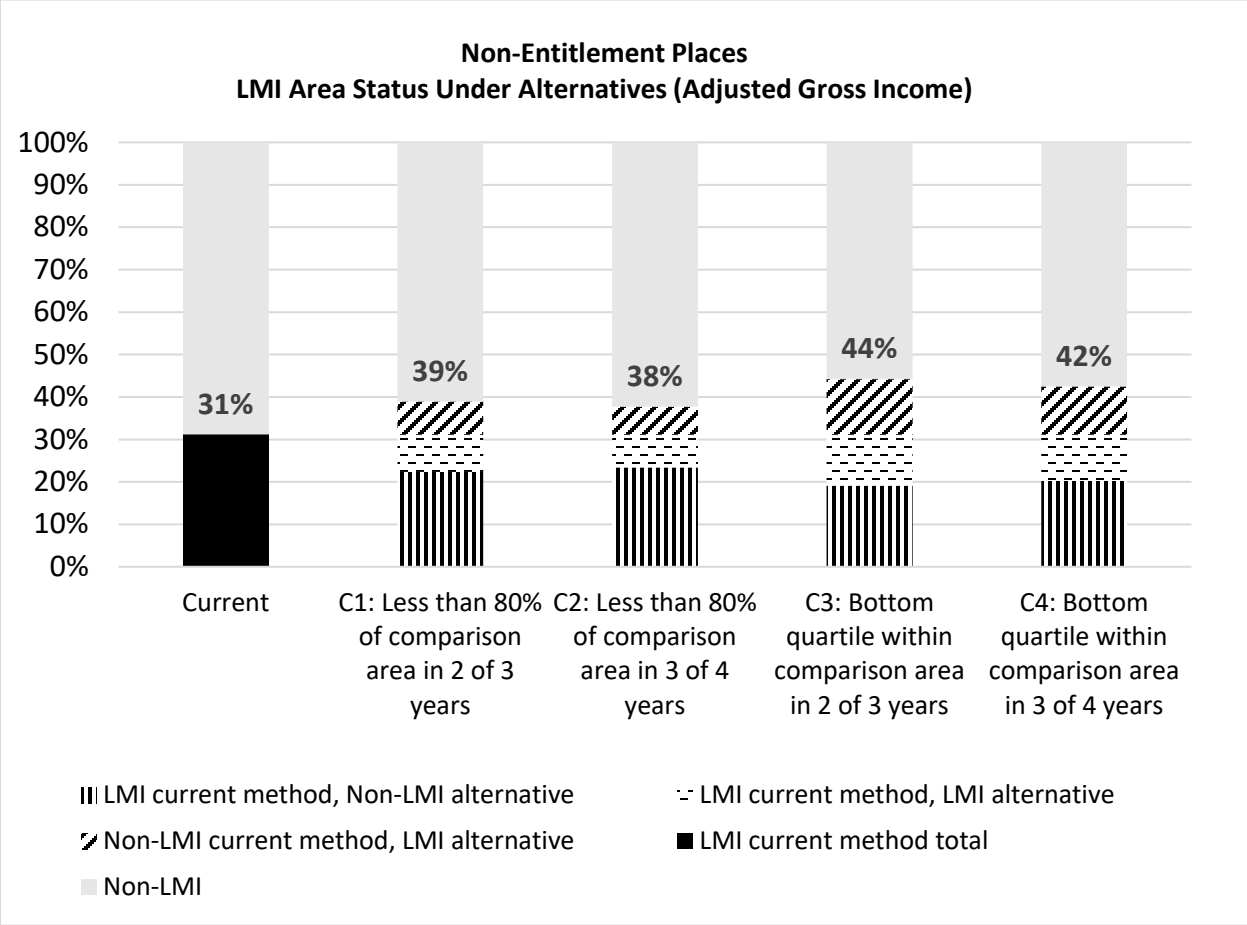
- C1. Average AGI per return is less than 80 percent of the comparison area average in 2 of 3 years,
- C2. Average AGI per return is less than 80 percent of the comparison area average in 3 of 4 years,
- C3. Average AGI per return is in the bottom quartile of places within the comparison area in 2 of 3 years,[1]
- C4. Average AGI per return is in the bottom quartile of places within the comparison area in 3 of 4 years,
- D1. Percentage of returns claiming EITC is greater than 125 percent of the comparison area percentage in 2 of 3 years,
- D2. Percentage of returns claiming EITC is greater than 125 percent of the comparison area percentage in 3 of 4 years,
- D3. Percentage of returns claiming EITC is in the top quartile of places within the comparison area in 2 of 3 years, and
- D4. Percentage of returns claiming EITC is in the top quartile of places within the comparison area in 3 of 4 years.

Exhibit 6 displays the estimated effect of application of the AGI-based rules as a supplemental method of qualifying for LMI area benefit activities in addition to the current LMISD eligibility determination. Under option C1, an additional 1,965 places would qualify as LMI, resulting in a total of 39 percent of places qualifying through 2014. Option C2 results in 1,662 newly qualified places and 38 percent total qualified places. Options C3 and C4, which are based on a place's average AGI falling in the bottom quartile of places within the comparison area, result in increases of 3,291 and 2,855 newly qualified places and 44 and 42 percent total qualified places, respectively. The small drop-off in qualified places when moving from a 2-of-3-years standard to a 3-of-4-years standard indicates a high degree of correlation of average AGI across years. This year to year correlation, also known as serial autocorrelation, is shown in Exhibit 14 in appendix

[1] Excluding places in comparison areas with less than four places. This restriction applies to all subsequent quartile-based analysis.

B. A high degree of autocorrelation decreases the impact of requiring more years of meeting a standard to qualify because meeting the standard in 1 year means that it is very likely to be met in following years as well. It should also be noted that the exhibit clearly displays that the majority of places that qualify under the current LMISD-based test do not also meet the AGI-based threshold, which may indicate that these measures are not capturing the same underlying factor of economic distress.

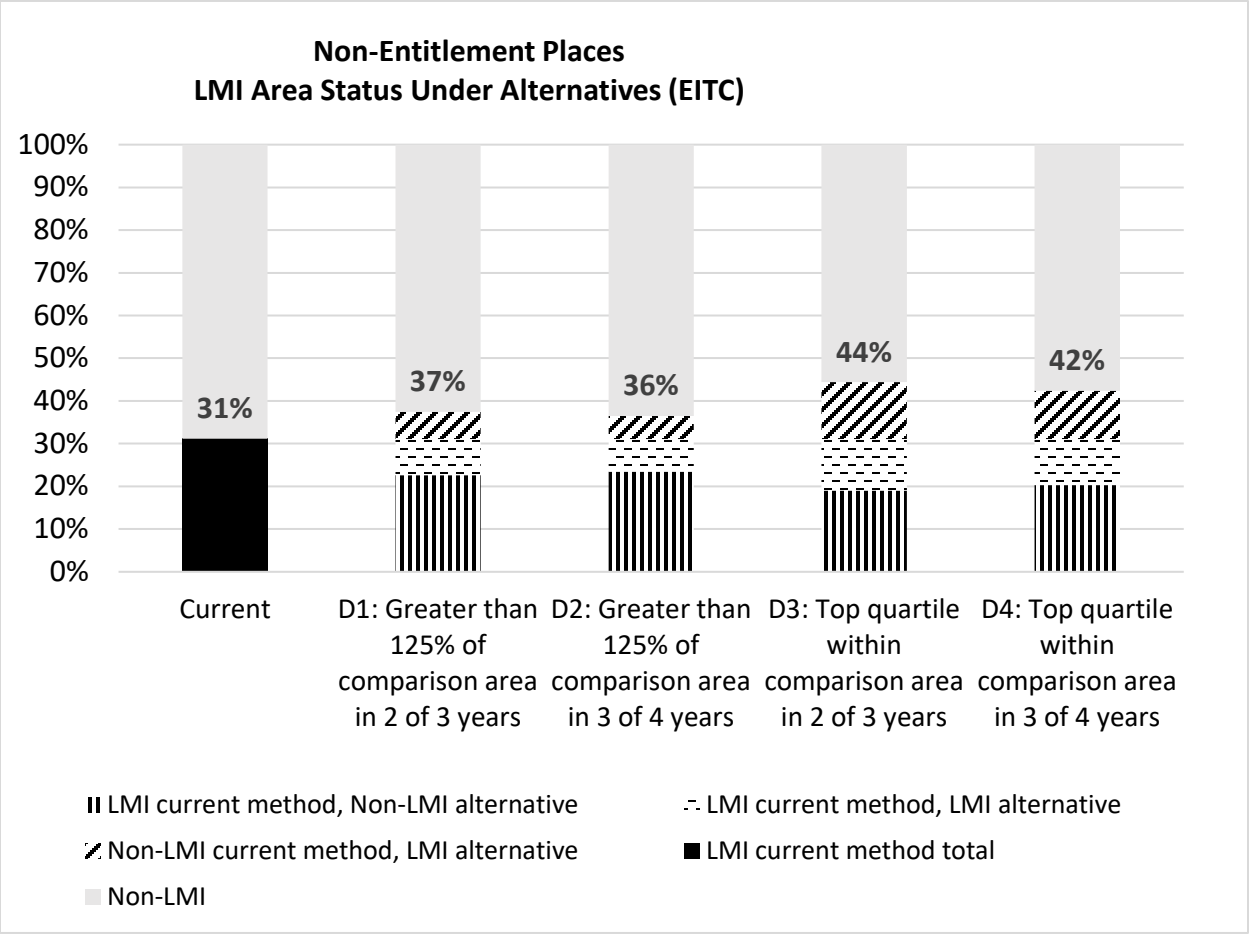
Exhibit 6. Proportion of Jurisdictions Qualifying as LMI under Current and Proposed Rules over Years 2010 to 2014—IRS-Adjusted Gross Income Metrics



IRS = Internal Revenue Service. LMI = low- to moderate-income.

Exhibit 7 shows that option D1, under which a place would qualify as LMI if its percentage of returns claiming EITC is above 125 percent the percentage in its comparison area in 2 of 3 years, would result in 1,595 additional LMI places. In total, 37 percent of places would be considered LMI under this option as of the release of 2014 data. Option D2, which requires a greater EITC percentage in 3 of 4 years, adds 1,352 new LMI places compared to the baseline and results in 36 percent of places qualifying. The quartile-based standards D3 and D4 result in 3,330 and 2,834 new LMI places and 44 and 42 percent total qualified places, respectively. As earlier, this pattern of results shows evidence of high serial autocorrelation of estimates and relatively low correlation with the current LMISD-based estimates. Indeed, exhibit 14 in appendix B shows that the correlation of percentage of returns with EITC claims is over 0.95 even when comparing estimates from 5 years apart. Within places, this variable is incredibly stable from year to year.

Exhibit 7. Proportion of Jurisdictions Qualifying as LMI under Current and Proposed Rules over Year 2010 to 2014—IRS Earned Income Tax Credit Metrics



EITC = Earned Income Tax Credit. IRS = Internal Revenue Service. LMI = low- to moderate-income.

Use of Broader Measures of Economic Distress as Proxies for LMI Measures

Moving from strictly income-based measures of economic distress in the targeting of community development spending to broader measures would represent a more dramatic change to program rules and would likely need statutory amendments. The passage of Public Law 14-113 (Section 244), however, which allowed jurisdictions within Rural Promise Zones and distressed counties defined by the Appalachian Regional Commission to use LMISD data from the 2000 decennial census rather than 2010 ACS-based LMISD in the determination of LMI area benefit qualification, possibly demonstrates Congress' willingness to consider such changes. The following sections present several options drawing from administrative data sources.

Home Price Indices from the Federal Housing Finance Agency

The Federal Housing Finance Agency (FHFA) began producing house price indices (HPI) at the census tract level in 2017 (Bogin, Doerner, and Larson, 2016). HPIs measure changes in home prices in a specified area, while controlling for housing quality. The FHFA HPI controls for housing quality by employing a repeat-sales methodology, whereby multiple sales of the same

home are compared at different points in time. The dataset on which the indices are based includes all transactions involving conforming, conventional mortgages that are purchased or securitized by Fannie Mae or Freddie Mac. Only transactions involving single-family homes are included, totaling nearly 100 million observations. HPIs are not official FHFA estimates but rather intended to be used for experimental or developmental purposes. It is also unclear how often the indices will be updated in the future, if at all, or whether FHFA would approve of them being used for program administration purposes.

Baseline years for areas' indices differ depending on the availability of data. An individual index begins in the first year in which at least 25 half-pairs (the sale of home that is later resold) are captured in the dataset. Once that threshold is met, a baseline sales price is established and transformed to equal 100. All subsequent years' estimates are relative to the baseline value and similarly transformed to be comparable to 100, such that an HPI estimate of 110 represents a 10-percent increase in home prices. The indices are not smoothed or adjusted for seasonality. Home addresses are matched to physical locations, and the most current geographic code for that location is attached to all previous transactions involving the property so that census tract assignments are consistent throughout the study period even if tract boundaries were adjusted at some point.

Estimates based on small sample sizes are suppressed in the FHFA dataset. Between the years 2009 to 2014, the percentage of census tracts with valid HPI data ranges from 68 percent to 73 percent. The variable of interest in the present analysis is percentage change in HPI, which places all tracts on the same scale. Because a percentage change requires 2 years of data, 2 consecutive years of non-missing estimates are needed, which increases the percentage of missing estimates that are excluded from analysis. Puerto Rico and insular areas are also missing in the data set.

Because analysis is performed at the place level of geography, census tract-based HPI estimates must be aggregated. Again, a weighted averaging method is employed. The weight used is the number of the place's housing units, from ACS 2010 5-year estimates, that are in each intersecting census tract. A place is excluded from analysis if less than 90 percent of its housing units are situated in tracts with missing HPI data. Accounting for restrictions and data excluded from the FHFA release, between 35.5 and 40.1 percent of the non-entitlement places have missing data for percentage change in HPI for the years 2010 to 2014. This represents a major limitation of the FHFA data for the purposes of using it as an alternative measure for LMI status.

As with the IRS data, HUD Income Limit Areas serve as the comparison for places in metropolitan areas, and state non-metropolitan totals are used as the point of comparison for non-metropolitan places. For places that span HUD Income Limit Areas, a weighted average of the areas is used for comparison, with count of housing units (from ACS 2010) within each place-county part serving as the weight. If any part of a place intersects with a non-metropolitan county, the state non-metropolitan aggregate serves as the comparison area.

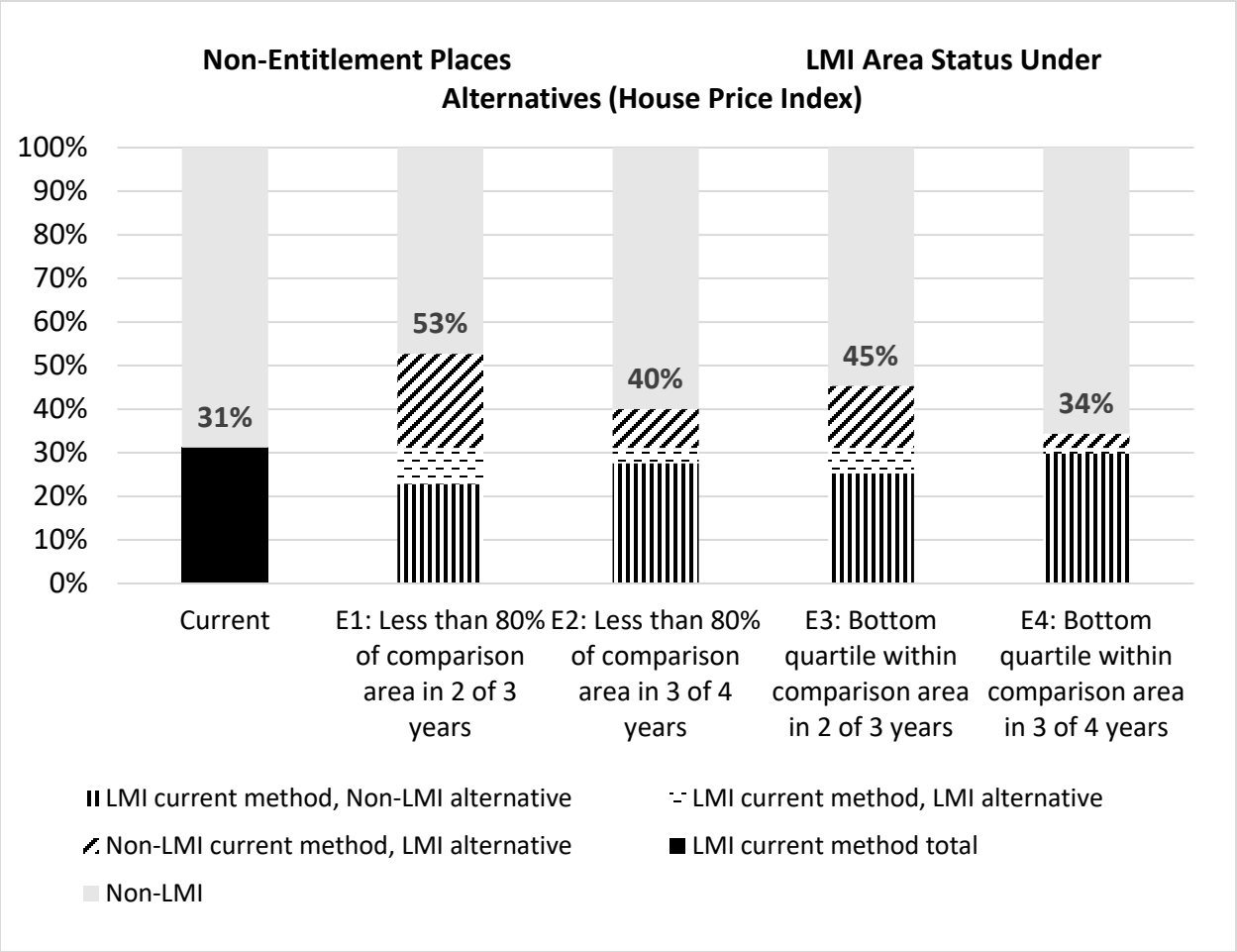
Limitations of the FHFA HPI data include:

- Puerto Rico and insular areas are excluded,
- Attached and multi-unit properties are excluded from the HPI,
- Federal Housing Administration and non-conventional loans are excluded from the HPI,
- The repeat sales method assumes constant-quality housing, which does not account for the impact of depreciation, renovations, distressed sales, and other factors that may affect the value of properties,
- The census tract-level HPI is not an official FHFA product and "should be considered as experimental or developmental" according to its authors (Federal Housing Finance Administration, 2018), and
- Geographic coverage is limited due to data suppression related to small sample sizes.

There are several possible metrics based on the FHFA HPI data that could potentially be employed in the qualification of places as LMI, including:

- E1. Percentage change in HPI is less than 80 percent of the comparison area percentage in 2 of 3 years,
- E2. Percentage change in HPI is less than 80 percent of the comparison area percentage in 3 of 4 years,
- E3. Percentage change in HPI is in the bottom quartile of places within the comparison area in 2 of 3 years, and
- E4. Percentage change in HPI is in the bottom quartile of places within the comparison area in 3 of 4 years.

Exhibit 8. Proportion of Jurisdictions Qualifying as LMI under Current and Proposed Rules over Years 2010 to 2014—FHFA House Price Index Metrics



FHFA = Federal Housing Finance Agency. LMI = low- to moderate-income.

Exhibit 8 displays the results of the HPI-based rules. Compared with the current LMISD rule, option E1 would result in 5,410 more non-entitlement places qualifying as low- and moderate-income and a total of 53 percent of all places qualifying by 2014. Option E2, which requires 3 of 4 years where a place's percentage change in HPI is less than 80 percent of the percentage change in its comparison area, results in a total of 40 percent of places qualifying or 2,236 additional LMI places. Quartile-based options E3 and E4 result in 45 and 34 percent of places qualifying, respectively; these options would result in 3,575 and 833 additionally qualified places. The pattern of results reveals several underlying facts. There is a low level of correspondence between qualifying under the HPI-based options and qualifying with the current LMISD rule. The large drop-off between the number of qualifying places depending on whether a "2 of 3" or "3 of 4" year condition is required indicates a low degree of serial autocorrelation in the HPI metric, as confirmed in exhibit 14 in appendix B. This is possibly the result of the transformation of HPI into a percentage change variable, which may be less stable.

Residential Vacancy Rates from the U.S. Postal Service

HUD receives address-level data on residential vacancy from the U.S. Postal Service (USPS) and has an agreement that allows it to release aggregated vacancy data at the census-tract level. The data set represents the universe of addresses in the United States. It is updated quarterly. The data set contains three variables of interest: total number of residential addresses, number of vacant residential addresses, and number of "no-stat" residential addresses. Vacant addresses are those which have been identified as being vacant and not collecting mail for at least 90 days by the delivery staff. No-stat residential addresses are addresses of homes under construction or identified by a carrier as not likely to be occupied for a long period of time. No stat counts also include rural route and PO Box addresses. This analysis calculates vacancy rate as the percentage of total addresses (excluding no-stat addresses) that are coded as vacant. The dataset's lack of coverage for households that live on rural routes or rely PO Boxes for mail delivery represents a significant limitation, especially as it would be applied to the state CDBG program that largely covers rural places.

Data from the second quarter of years 2010 to 2014 are used. As a result, the seasonality of vacancy rates may be a limitation. Missing data are not a significant issue, with less than 0.5 percent of census tracts with missing data in any year. Insular areas of American Samoa, U.S. Virgin Islands, and Guam are missing data until 2014. Unlike several of the other administrative data sets, the USPS data includes Puerto Rico, although 16 to 17 percent of Puerto Rican census tracts have missing data each year.

Vacancy rates calculated at the census tract level are transformed to the place level using a weighted averaging approach, with the housing unit count from the 2010 ACS used as the weighting instrument. Places where less than 90 percent of housing units fall in census tracts with non-missing data are counted as missing. Roughly 3.5 percent of places have missing USPS vacancy data after applying this criterion.

HUD Income Limit Areas again serve as the comparison area for places in metropolitan areas, and state non-metropolitan totals are used as the point of comparison for non-metropolitan places. If a place spans more than one Income Limit Area, a weighted average of the areas is calculated and serves as the comparison area. The count of housing units from ACS 2010 serves as the weight. If any part of a place lies within a non-metropolitan county, the state non-metropolitan total serves as the comparison area. The comparison area's vacancy rate is adjusted to 125 percent to capture a narrower proportion of qualifying places.

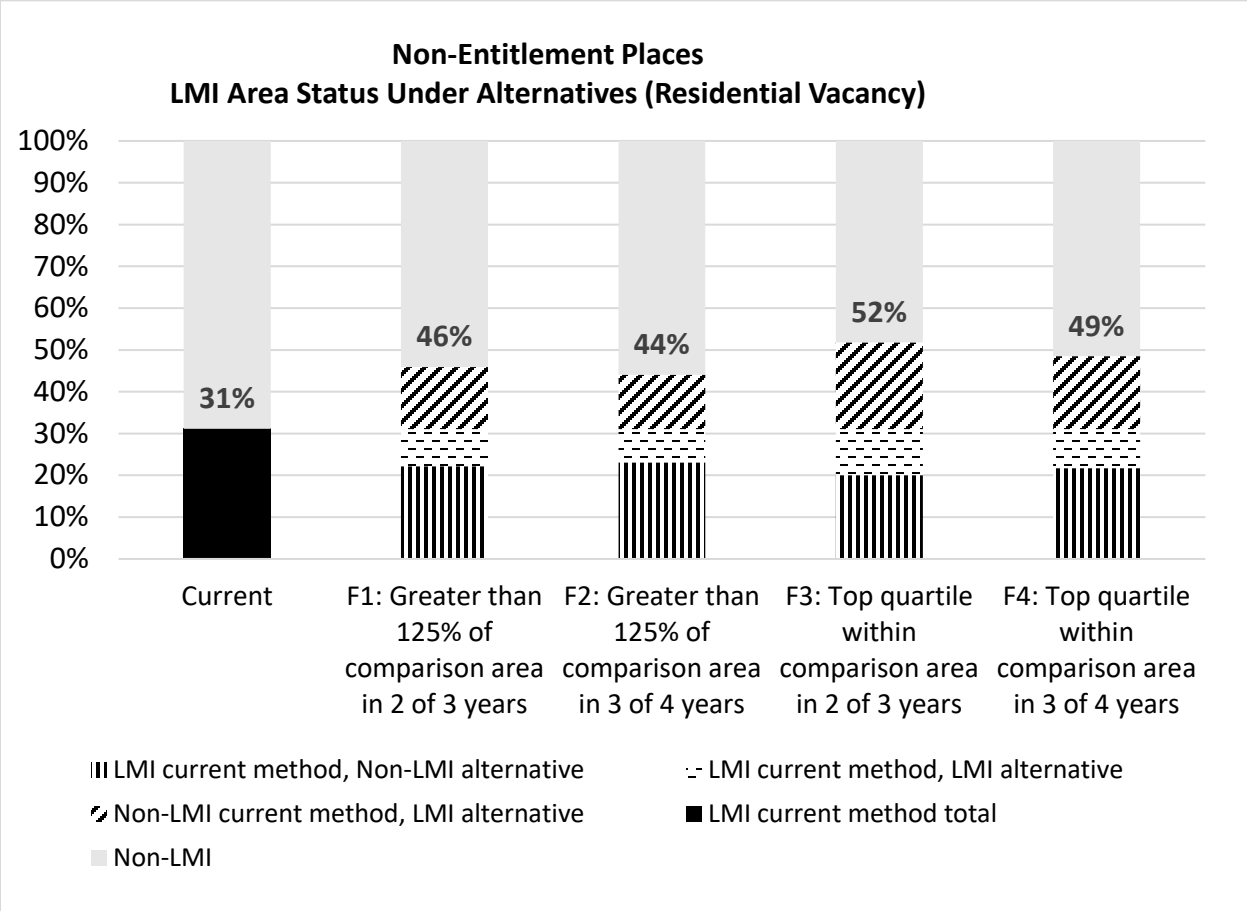
The following limitations of the USPS vacancy dataset should be acknowledged:

- Data for insular areas is missing until 2014,
- Rural route and PO Box addresses are excluded from the data, which may reduce data coverage and accuracy in rural areas, and
- Seasonality, which is not accounted for in this analysis, may be associated with large shifts in vacancy rates.

The following metrics use USPS vacancy statistics to potentially serve as alternative standards for LMI qualification:

- F1. Percentage of residential vacancy is greater than 125 percent of the comparison area percentage in 2 of 3 years,
- F2. Percentage of residential vacancy is greater than 125 percent of the comparison area percentage in 3 of 4 years,
- F3. Percentage of residential vacancy is in the top quartile of places within the comparison area in 2 of 3 years,
- F4. Percentage of residential vacancy is in the bottom quartile of places within the comparison area in 3 of 4 years.

Exhibit 9. Proportion of Jurisdictions Qualifying as LMI under Current and Proposed Rules over Years 2010 to 2014—USPS Residential Vacancy Metrics



LMI = low- to moderate-income. USPS = U.S. Postal Service.

Exhibit 9 shows the results of analysis where vacancy-based rules are applied to 2010 to 2014 data. Options F1 and F2, which require at least 2 or 3 years in which a place must have a higher vacancy rate than its comparison area, respectively, result in 3,714 and 3,255 additional LMI qualified places by 2014. Options F3 and F4, which require the place to be in the top quartile of places within the comparison area, would result in 5,195 and 4,363 new LMI places compared to the current rule, respectively. The relatively high percentage of places that qualify as LMI under these rules compared with the earlier options using other administrative datasets, is largely the result of decreased levels of missing data. The small drop-off in percentage of places qualifying as LMI between options that require 2 of 3 years of meeting the relevant threshold and those that require 3 of 4 years suggests a high degree of serial autocorrelation, such that places with a high vacancy rate in 1 year are likely to have a high rate in subsequent years. The correspondence between LMISD-based eligibility and vacancy-based eligibility appears to be relatively low.

Jobs per Capita from the Census Bureau's Longitudinal Employer-Household Dynamics Program

The Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Program combines state-supplied administrative data on employers and workers with existing census products and federal administrative records to create a rich longitudinal data system. Data sources include unemployment insurance earnings data, which provides employment and earnings data at the job level, and the Quarterly Census of Employment and Wages, which provides information about employers. All data are publicly available at the census-block level of geography, which allows for easy aggregation into any other geographic level without the need for averaging.

The metric of interest for this analysis is a ratio of the count of jobs held by residents of a place to the working-age population of that place. Population estimates come from ACS 5-year samples. Working-age population includes all people aged 18 to 64. A weakness of the jobs per capita metric is that it does not control for the type of jobs, whether they are full- or part-time. The following analysis assumes that a low ratio of jobs to population is characteristic of relatively poor local economic conditions. It could also be the case, however, that a relatively worse off labor market would produce many low-paying jobs compared to a strong labor market that produces fewer, but stable and high-paying, jobs. For this reason, results should be interpreted with caution.

Comparison areas remain HUD Income Limit Areas for metropolitan places and state non-metropolitan totals for non-metropolitan places. For places that span multiple areas, a weighted average is used for comparison, with the count of housing units of the place that falls within each area serving as the weight. A place is counted as non-metropolitan if any of its area falls within a non-metropolitan county.

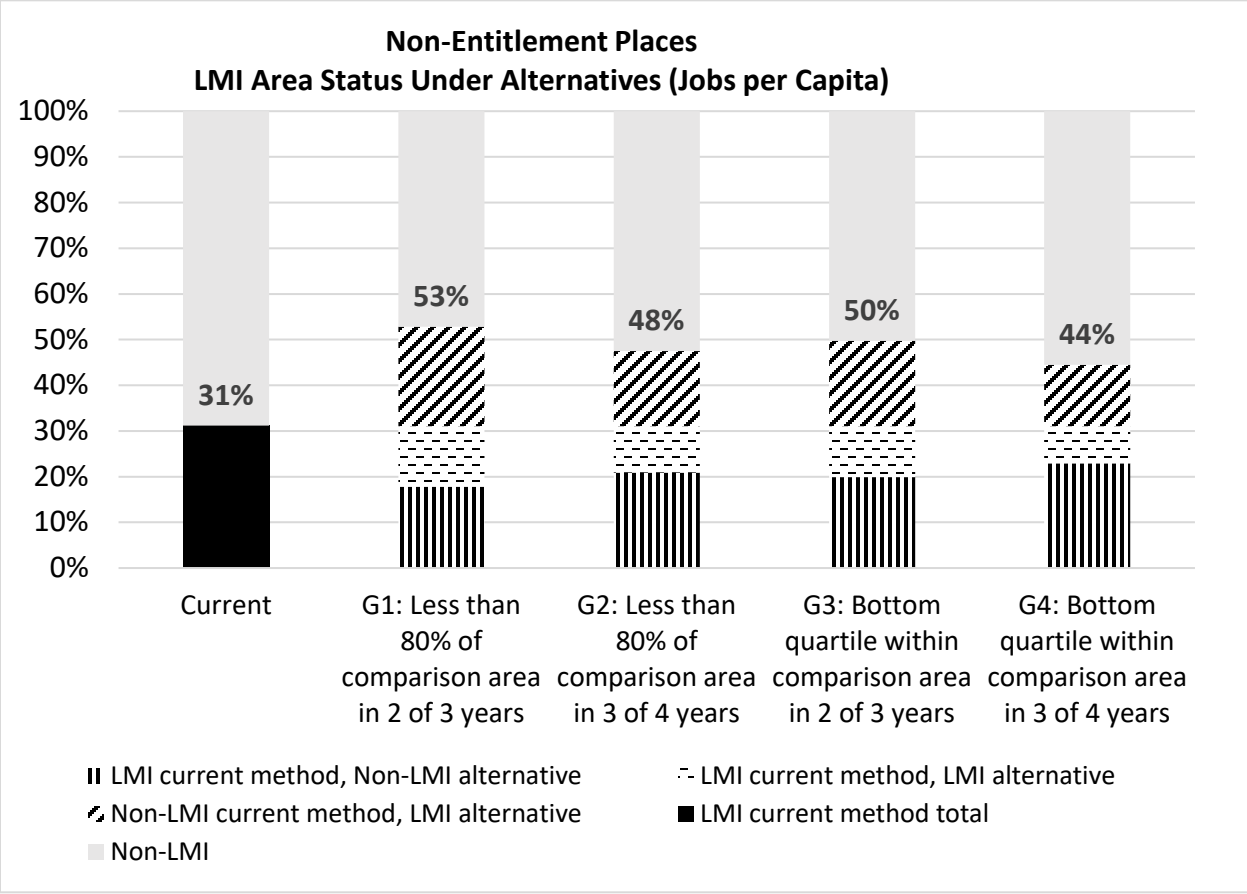
This dataset and calculated metrics are limited in several critical ways:

- Data for Puerto Rico and insular areas are not available, and
- The job to population ratio may not be a valid measure of an area's economic vitality.

The following options could potentially serve as alternative metrics for LMI area benefit qualification:

- G1. Job to working-age population ratio is less than 80 percent of the comparison area ratio in 2 of 3 years,
- G2. Job to working-age population ratio is less than 80 percent of the comparison area ratio in 3 of 4 years,
- G3. Job to working-age population ratio is in the bottom quartile of places within the comparison area in 2 of 3 years, and
- G4. Job to working-age population ratio is in the bottom quartile of places within the comparison area in 3 of 4 years.

Exhibit 10. Proportion of Jurisdictions Qualifying as LMI under Current and Proposed Rules over Years 2010 to 2014—LEHD Jobs per Capita Metrics



LEHD = Longitudinal Employer-Household Dynamics. LMI = low- to moderate-income.

Analysis of the LEHD data reveals relatively high proportions of non-entitlement places meeting the proposed alternative LMI qualification rules. This could be evidence that the jobs to

population metric is a poor measure of economic distress, or that small non-entitlement places fare particularly poorly relative to their comparison areas, which often include central cities.

As shown in exhibit 10, employing option G1 results in 53 percent of all non-entitlement places qualifying as LMI by 2014, after the addition of 5,440 newly qualified places. Option G2 adds 4,116 new LMI places for a total of 48 percent of places qualifying. Option F3 results in 4,674 more places qualifying, while option F4 results in 3,351 more places meeting the threshold. Options G3 and G4 result in 50 and 44 percent of places qualifying, respectively.

Multi-Part Eligibility Tests

Many more options exist for determining eligibility for LMI area benefit activities that draw on data from multiple sources. Such options include combinations of rules discussed earlier or additional thresholds that must be met to qualify as an LMI area. Options could be as simple as a two-part test that requires a first standard to be met before an additional threshold can be employed or more complicated, as in the case of a list of multiple data options that can be selected as evidence of LMI status after an initial criterion is satisfied. Policymakers would need to weigh the benefits of increased flexibility with the administrative burden of managing more complicated rules.

As an example, a two-part test could be established such that an area would first need to demonstrate that the 51-percent LMI threshold is within the confidence interval around its estimated LMI percentage as measured in the most recent LMISD, in this case the one based on ACS 2006–2010, and then meet an additional threshold based on administrative or off-year ACS data. The first step eliminates 9,856 of the 17,160 places that did not already qualify as LMI based on the LMISD estimates. The remaining 7,304 places would then need to qualify under one of the rules specified in the options explained earlier. For instance, applying option B3, which requires a jurisdiction to be in the bottom quartile of places within its comparison area in terms of average AGI for 2 of 3 years, would result in 1,856 newly qualified places by the fourth year following the release of ACS 2006–2010 estimates. This represents a 43-percent decrease in the number of qualifying places compared to option B3 without applying the confidence interval test as a first step.

This type of rule would have the benefit of providing additional stability because it substantially decreases the pool of potentially eligible places and locks it in for 5 years. It would also likely result in a more targeted program compared with policies in which administrative data are introduced without an initial qualifying threshold. It also emphasizes the primacy and quality of the ACS-based estimates, which have heretofore been the only source of LMI data beyond local income surveys. It acknowledges the limitations of probability-based estimates by allowing jurisdictions with confidence intervals that include the 51-percent LMI threshold and, therefore, have estimates that are not statistically different from a qualifying estimate, to have an opportunity to demonstrate eligibility through additional means.

Such a rule would also introduce several limitations. It would be more complicated to manage for administrators and to navigate for grantees. If it locks in first-stage qualification based on LMISD estimates, it would also potentially exclude places that have rapidly deteriorating economic conditions. This is only a weakness when compared to other alternatives discussed earlier but not when compared to the current rule which also would fail to capture recent economic changes.

Evaluating Alternative Methods

The value of alternative administrative data sources and revised rules concerning LMI area determinations depend in large part on the extent to which they address the shortcomings of the current data and policies. As discussed earlier, the LMISD has noteworthy limitations including imprecise estimates for small population areas, relatively inflexible geographic scope, and lack of recency. The use of administrative data, in general, is well suited to address the first limitation because it is 100 percent data and, therefore, does not suffer the effects of sampling error. Missing and suppressed data are, however, a consistent issue across administrative datasets, thereby reducing this beneficial aspect. All the administrative data sets discussed in this analysis also offer data that are more current than the LMISD. With regard to geography, the approaches discussed earlier all require transformation, often involving weighted averaging, to fit the place-level estimates offered in the LMISD. The precision of estimates may be sacrificed as a result of such averaging. None of the options can be applied at a more disaggregated geography than the block group data that are available using ACS-based LMISD.

Alternative methods for determining LMI status must also meet additional criteria to be viable policy options. Perhaps most importantly, any rule must be consistent with statutory and programmatic intent. CDBG's national objections provide guidance. The primary objective is to provide "activities benefiting [LMI] persons." The evidence provided by the alternative datasets discussed in this paper matches this criterion to varying degrees. Tax data on income and EITC claims most closely align with the income definition, although households that do not file federal taxes are missing from the IRS data but would be considered members of the LMI population for purposes of the program. Data on residential vacancies, jobs, and house prices represent broader measures of the economic health of an area. Policymakers would need to either expand the definition of the primary national objective or accept that these measures can be interpreted as proxies of a community's income characteristics.

How well alternative metrics from administrative datasets are measuring the same underlying factor of economic distress captured by percentage LMI persons can be explored through correlation analysis. A higher absolute value of correlation would indicate a stronger correspondence with the percentage LMI as calculated in the special tabulation LMISD. A low correlation would indicate that the measures are unrelated. Exhibit 11 shows the correlation of metrics derived from alternative data sources with the LMI percentage as determined by LMISD. With a correlation of 0.781, the standard ACS table-based calculation of LMI percentage corresponds quite closely with the LMISD estimates. All metrics derived from administrative

datasets are relatively weakly correlated with LMI percentage calculated under current rules. As would be expected, the IRS-derived measures are most strongly correlated, while the HPI, vacancy, and jobs per capita metrics show almost no association with LMI percentage. These metrics are simply capturing different things.

Exhibit 11. Correlation of Alternative Distress Metrics with LMI Percentage from LMISD—2010 Data for All Measures

Percentage LMI (Standard Table Method)	Average AGI	Percent Tax Returns Claiming EITC	Percent Change HPI	Residential Vacancy	Jobs per Capita
0.781	-0.262	0.356	-0.004	0.102	0.004

AGI = adjusted gross income. EITC = earned income tax credit. HPI = house price indices.
LMI = low- to moderate-income. LMISD = low- and moderate-income summary data.

Alternative measures also should be relatively easy to implement, free of errors, collected and calculated in a transparent manner, and reliably available in future years. All the alternative measures discussed in this paper, except the ACS standard table-based estimates, compare negatively with the current use of LMISD in these areas. Drawing data from multiple sources each year would increase staff effort in terms of collection and preparation and lead to higher likelihood that errors could be made in calculating the estimates of interest. HUD staff tasked with verifying grantee data will have more complicated rules to interpret and more data points with which they would need to familiarize themselves. None of the administrative datasets provide the same level of documentation and transparency as the ACS. Further, there is no guarantee that these data sets will remain publicly available in future years.

Finally, it would need to be demonstrated that the alternative measures of distress were valid representations of characteristics of specific geographic areas. Unlike LMISD, which is aggregated to specific geographies of interest such as place and census block group, administrative data often must be transformed to match these geographies because they are originally released at the ZIP Code or census tract levels. In these cases, a weighted averaging technique was employed to produce the best possible estimate for place-level jurisdictions. This can be a relatively crude approximation in many cases, however. Even when a place falls completely within a large geography from which data are drawn, the use of the larger geography's estimates for the place may not be an accurate representation of the local conditions. For example, a small town within a much larger ZCTA may have a significantly different average AGI than the ZCTA due to the spatial distribution of incomes within the area.

Conclusion

CDBG is a flagship community development program that from its inception has been intended to be targeted at communities most in need of assistance. The ability to do such targeting relies, in part, on the existence of accurate data on the level of need within communities. In 2014, CDBG began to rely on ACS 5-year estimates of income in the determination of eligibility for

LMI area benefit activities. The smaller sample sizes of the ACS, compared to the previously used long-form decennial census, resulted in less precise estimates with larger margins of error. This issue was most pronounced in small jurisdictions, which are largely the focus of the state CDBG program that covers all non-entitlement communities.

Frustration around the quality of ACS estimates and the HUD policy that locks these estimates in place for 5 years has motivated an examination of possible alternative data sets and policies that could be implemented to alleviate these concerns. This paper looked at the potential use of administrative data sets and alternative uses of ACS data to supplement or replace existing data practices. Specifically, it assembled data from IRS, FHFA, the Census Bureau, and USPS to test hypothetical eligibility metrics related to average AGI, percentage of EITC claims, residential vacancy rates, changes in HPI, and jobs per capita. These metrics vary in the level to which they measure the same underlying economic conditions as the existing standard of the percentage of LMI persons, and none are highly correlated with ACS estimates of LMI. Other limitations include high levels of missing or suppressed data, lack of coverage of Puerto Rico and insular areas, and data needing to be aggregated to geographic levels that do not match the existing CDBG geographies. Many of the advantages of using population-level administrative data are substantially weakened due to the levels of missing data and the need to average aggregate data across geographies so that they match the place-level geography necessary for the purposes of CDBG.

The acceptability of these alternative data practices would need to thoroughly be considered by program administrators and policymakers. Some of the metrics discussed, such a vacancy rates and home prices, are not conceptually good proxies for income, and this analysis shows that they are only very weakly correlated. As such, it would need to be argued conclusively that eligibility based on such metrics aligns with the statutory intent of the program.

Because of the low correlation with ACS's LMI estimates, incorporating administrative data into the CDBG area benefit test could result in a substantial increase in the number of areas eligible for low- and moderate-income benefit activities. One of the options presented earlier would result in 56 percent of non-entitlement places being eligible for LMI area benefit activities. Many other options would result in significantly less expansion than that, but all options that offer alternative means for qualification will result in at least some increase in the number of qualified areas. Expanding the pool of eligible places necessarily decreases how narrowly CDBG funding is targeted, which may also conflict with statutory intent.

This paper presents no clear solutions to problems concerning alternative approaches to LMI data. All options have significant limitations and address the shortcomings of current policies only to a certain degree. The use of administrative data to supplement the census-based estimates seems to have too many shortcomings to be justified. As new administrative datasets are made available or improvements are made to the existing datasets, such as offering data at different

geographic levels or expanding coverage in Puerto Rico and the insular areas, HUD should revisit the question of whether these types of data could be useful in supplementing LMISD.

More feasible approaches involve new uses of ACS data, including off-year LMISD releases and standard table-based LMI calculations. Allowing for the use of such data and methods as supplements to the official LMISD released on a 5-year cycle would increase the number of places that are eligible for low- and moderate-income area benefit activities, including, presumably, many that currently fall short of the threshold simply due to the imprecision inherent in sample-based estimates. Because there is chance involved in whether or not a low population place's estimated LMI percentage falls above the threshold, allowing for off-year challenges and slightly different calculations based on standard tables essentially allows these communities additional "rolls of the dice" to establish eligibility. Estimates produced by such methods are of high quality and are available at all necessary geographic levels. Like the current LMISD, estimates produced by these methods would be highly transparent.

Given the preference for stability in the CDBG planning process, however, it may be necessary to impose some constraints on off-year challenges (whether based on special or standard tables). Allowing any off-year estimate to establish eligibility would essentially make the LMISD an annual release, which HUD has previously determined to be disadvantageous. Instituting a rule that LMI thresholds must be met in 2-of-3- or 3-of 4-year timeframes would somewhat alleviate this issue. Such a rule would be consistent with the HUD's policy regarding QCTs for the LIHTC program. Although such a policy would be relatively easy to administer, it would make guidance to grantees more complex and potentially increase the risk of erroneous reporting. Posting new ACS special tabulations on HUD websites annually could possibly confuse grantees and would increase the burden on administrators. Allowing estimates derived from standard ACS tables would be the least burdensome option from HUD's perspective because grantees would be able to access and process data independently, as long as the instructions from HUD are clear. Previous guidance from the 1980s and 2000s could be updated to serve this purpose.

All the analysis presented so far has focused on the aggregate effects of potential policy changes. The effect of such changes, however, would be most acutely felt at the individual grantee level. Allowing new data sources to be used to establish eligibility would allow more areas to qualify for area benefit activities; although, in the absence of increased funding for the state CDBG program, it is uncertain how changes would affect the actual distribution of funding at the local level. A hypothetical case study of one town and how its eligibility would change under the options discussed above is presented in appendix A. In the case study, a small town that narrowly missed qualifying under the last LMISD release is found to qualify under 7 of 30 options related to administrative data or expanded use of ACS data. This case is likely typical of many places across the country, and it demonstrates the complexity of adopting changes to rules around data in the CDBG program but also possibly some of the promise related to exploring new options.

Appendix A. Application of Options on a Hypothetical Case (Pe Ell, WA)

The community of Pe Ell, WA, with a population of 632 according to the 2010 Census, has been cited as an example of a place in which current ACS-based LMI data fail to accurately measure true economic conditions (Osowski, 2016). It offers a test case on which the options discussed in this paper may be applied to assess the impact on eligibility. Pe Ell lies in Lewis County, Washington, a non-metropolitan county in the southwestern part of the state. Thus, Washington's non-metropolitan counties serve as the town's HUD Income Limit Area as well as the comparison area in several of the metrics being considered.

The 2006–2010 LMISD estimates that exactly 50 percent of residents are LMI, and, therefore, the town just misses the 51-percent threshold for LMI area benefit activities. With a margin of error of 15.5 percentage points, the estimate's confidence interval includes qualifying percentages well above 51 percent, although only the point estimate is considered under current CDBG rules.

Exhibit 12 shows the results of the application of potential supplemental LMI eligibility metrics to Pe Ell. Of the 24 options discussed in the memorandum, the town would qualify as LMI under 11 of them. One off-year ACS estimate, specifically in 2011, shows the town with an LMI population above 51 percent, which would qualify it under option A1. It also meets the eligibility threshold using ACS standard table estimates from both methods of calculation in 2011, but it does not meet the required conditions in any other year using either of those methods.

The town does not meet the average AGI condition in any year when using the 80 percent of area average standard, although it fares significantly better when using quartile-based standards. It meets eligibility standards related to percentage of EITC claims in 3 of the 5 years included in the analysis, regardless of whether the standards where based on quartile or comparison area percentage.

The town would not qualify under the options related to the percentage change in HPI, as supplied by FHFA data. The town does not fall in the bottom quartile of places within the comparison area, except for one year, or below 80 percent of the area average, except for 2 years, and thus fails to meet the hypothetical qualification threshold for those options.

According to USPS data, the town is estimated to have zero residential vacancy in all years, and it fails to qualify based on any vacancy-related metric. As noted earlier, rural route and PO Box addresses are excluded from the USPS vacancy data. It is unclear how significant an issue this is in the case of Pe Ell, but it is possible that the dataset's coverage of rural towns like this is quite poor. This is an example of why vacancy data in rural, sparsely populated areas should be viewed with caution. Finally, Pe Ell fails to meet any of the hypothetical eligibility conditions related to the jobs per working-age population metrics.

Exhibit 12. Applications of Alternative LMI Options—Pe Ell, WA

Option	Metric	Estimate (Pe Ell, WA)	Comparison Area Estimate (Non-Metro WA)/ Threshold	Qualified?
Current	Estimate in ACS 2010 5-year above 51%	50%	51%	No
A1	Estimate above 51% LMI in any year	11: **52%** 12: 46% 13: 46% 14: 36%	51%	Yes
A2	Estimate above 51% LMI any 2 of 3 years			No
A3	Estimate above 51% LMI any 3 of 4 years			No
A4	Confidence interval above 51% in any year			No
B1	Estimate of 51% LMI in any year (Standard table size-adjusted method)	10: 42% 11: **55%** 12: 49% 13: 46% 14: 34%	51%	Yes
B2	Estimate above 51% LMI any 2 of 3 years (Standard table size-adjusted method)			No
B3	Estimate above 51% LMI any 3 of 4 years (Standard table size-adjusted method)			No
B4	Estimate of 51% LMI in any year (Simple median comparison method)	Family: 10: $47,404 11: **$39,375** 12: $48,125 13: $46,167 14: $53,636 Nonfamily: 10: **$15,221** 11: **$14,706** 12: **$16,250** 13: **$14,286** 14: **$14,118**	4-person lim.: 10: $41,700 11: $43,200 12: $44,000 13: $43,350 14: $45,500 1-person lim.: 10: $29,200 11: $30,250 12: $30,800 13: $30,350 14: $31,850	Yes
B5	Estimate above 51% LMI any 2 of 3 years (Simple median comparison method)			No
B6	Estimate above 51% LMI any 3 of 4 years (Simple median comparison method)			No
C1	Avg. AGI below 80% comparison 2 of 3 years	10: 39.3 11: 40.4 12: 43.5 13: 43.5 14: 43.3	10: 36.8 11: 37.8 12: 40.7 13: 40.7 14: 42.3	No
C2	Avg. AGI below 80% comparison 3 of 4 years			No
C3	Avg. AGI in bottom quartile 2 of 3 years	10: **39.3** 11: **40.4** 12: 43.5 13: **43.5** 14: **43.3**	10: 41.0 11: 40.8 12: 43.3 13: 43.7 14: 45.5	Yes
C4	Avg. AGI in bottom quartile 3 of 4 years			Yes

Option	Metric	Estimate (Pe Ell, WA)	Comparison Area Estimate (Non-Metro WA)/ Threshold	Qualified?
D1	% EITC above 125% comparison 2 of 3 years	10: **21.5%** 11: 20.4% 12: **24.2%** 13: 20.6% 14: **23.5%**	10: 20.7% 11: 21.0% 12: 21.1% 13: 21.3% 14: 20.8%	Yes
D2	% EITC above 125% comparison 3 of 4 years			No
D3	% EITC in top quartile 2 of 3 years	10: **21.5%** 11: 20.4% 12: **24.2%** 13: 20.6% 14: **23.5%**	10: 20.6% 11: 20.5% 12: 20.8% 13: 20.9% 14: 20.5%	Yes
D4	% EITC in top quartile 3 of 4 years			No
E1	% change HPI below 80% comparison 2 of 3 years	10: **-9.8%** 11: -7.0% 12: -2.0**%** 13: **-1.2%** 14: 4.6**%**	10: -8.8% 11: -7.8% 12: -4.4% 13: -0.4% 14: 1.4%	No
E2	% change HPI below 80% comparison 3 of 4 years			No
E3	% change HPI in bottom quartile 2 of 3 years	10: **-9.8%** 11: -7.0% 12: -2.0**%** 13: -1.2% 14: 4.6**%**	10: -9.5% 11: -9.5% 12: -8.0% 13: -1.8% 14: -3.3%	No
E4	% change HPI in bottom quartile 3 of 4 years			No
F1	% vacancy above 125% comparison 2 of 3 years	10: 0%[2] 11: 0% 12: 0% 13: 0% 14: 0%	10: 3.5% 11: 3.7% 12: 3.8% 13: 4.2% 14: 3.9%	No
F2	% vacancy above 125% comparison 3 of 4 years			No
F3	% vacancy in top quartile 2 of 3 years	10: 0% 11: 0% 12: 0% 13: 0% 14: 0%	10: 4.4% 11: 3.9% 12: 4.4% 13: 4.4% 14: 4.4%	No
F4	% vacancy in top quartile 3 of 4 years			No
G1	Jobs per capita below 80% comparison 2 of 3 years	10: 1.3 11: 0.8 12: 0.8 13: **0.4** 14: 0.4	10: 0.5 11: 0.5 12: 0.5 13: 0.4 14: 0.4	No
G2	Jobs per capita below 80% comparison 3 of 4 years			No

[2] Rural route and PO Box addresses are excluded from the USPS vacancy data. It is unclear how significant an issue this is in the case of Pe Ell. Vacancy data in rural, sparsely populated areas should be viewed with caution.

Option	Metric	Estimate (Pe Ell, WA)	Comparison Area Estimate (Non-Metro WA)/ Threshold	Qualified?
G3	Jobs per capita in bottom quartile 2 of 3 years	10: 1.3 11: 0.8 12: 0.8 13: 0.4 14: 0.4	10: 0.5 11: 0.5 12: 0.5 13: 0.3 14: 0.3	No
G4	Jobs per capita in bottom quartile 3 of 4 years			No

ACS = American Community Survey. AGI = adjusted gross income. EITC = earned income tax credit.
HPI = housing price indices. LMI = low- to moderate-income
Note: Estimate bolded if specified threshold is met in a given year.

Appendix B. Summary Statistics

Exhibit 13. Median Estimates for Relevant Variables by Year—Non-Entitlement Places (N = 25,006)

	LMISD		ACS Standard Table Size-Adjusted Method	IRS		USPS	FHFA	LEHD
Year	LMI %	LMI % MOE	LMI %	Avg. AGI ($1,000s)	EITC %	Res. Vac. %	% Change HPI	Jobs/Pop
2010	43.1	11.8	43.4	44.3	18.8	1.3	-3.7	0.7
2011	43.2	11.6	43.5	44.9	18.7	1.2	-2.7	0.6
2012	43.9	11.4	44.2	47.3	18.5	1.2	-1.0	0.7
2013	43.8	11.2	44.2	47.8	18.6	1.3	1.7	0.5
2014	44.4	11.4	45.2	49.7	18.2	1.1	3.1	0.5

ACS = American Community Survey. AGI = adjusted gross income. EITC = earned income tax credit.
FHFA = Federal Housing Finance Agency. HPI = housing price indices. IRS = Internal Revenue Service.
LEHD = Longitudinal Employer-Household Dynamics. LMI = low- and moderate-income.
LMISD = low- and moderate-income summary data. MOE = margins of error. Res. Vac. = residential vacancy.
USPS = U.S. Postal Service.

Exhibit 14. Year-to-Year Correlation Matrices

(a) LMI Percentage—Special Tabulation LMISD

	2010	2011	2012	2013	2014
2010	1.000				
2011	0.854	1.000			
2012	0.753	0.866	1.000		
2013	0.664	0.763	0.866	1.000	
2014	0.584	0.671	0.759	0.861	1.000

(b) LMI Percentage—ACS Standard Table Sized-Adjusted Method

	2010	2011	2012	2013	2014
2010	1.000				
2011	0.838	1.000			
2012	0.740	0.869	1.000		
2013	0.646	0.766	0.863	1.000	
2014	0.568	0.668	0.763	0.862	1.000

(c) Average Adjusted Gross Income per Return

	2010	2011	2012	2013	2014
2010	1.000				
2011	0.926	1.000			
2012	0.956	0.946	1.000		
2013	0.944	0.967	0.970	1.000	
2014	0.955	0.961	0.979	0.978	1.000

(d) Percentage of Returns Claiming EITC

	2010	2011	2012	2013	2014
2010	1.000				
2011	0.979	1.000			
2012	0.970	0.976	1.000		
2013	0.962	0.969	0.975	1.000	
2014	0.955	0.963	0.969	0.976	1.000

(e) Residential Vacancy Rate

	2010	2011	2012	2013	2014
2010	1.000				
2011	0.919	1.000			
2012	0.883	0.964	1.000		
2013	0.817	0.892	0.924	1.000	
2014	0.752	0.830	0.865	0.940	1.000

(f) Percentage Change Housing Price Index

	2010	2011	2012	2013	2014
2010	1.000				
2011	0.082	1.000			
2012	0.196	-0.258	1.000		
2013	-0.069	-0.064	-0.219	1.000	
2014	-0.134	-0.132	0.050	0.000	1.000

(g) Jobs per Working Age Resident

	2010	2011	2012	2013	2014
2010	1.000				
2011	0.261	1.000			
2012	0.233	0.808	1.000		
2013	0.115	0.605	0.726	1.000	
2014	0.132	0.563	0.638	0.636	1.000

ACS = American Community Survey. EITC = earned income tax credit. LMI = low- to moderate-income. LMISD = low- to moderate-income summary data.

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