

Defining Rural at the U.S. Census Bureau

American Community Survey and Geography Brief

By Michael Ratcliffe, Charlynn Burd, Kelly Holder, and Alison Fields

Issued December 2016

ACSGEO-1

Introduction

What image comes to mind when thinking of a rural place? Does it include the farmhouse down the road? Does it include the new housing subdivision on the outskirts of town? Does it include the community that has formed at the crossroads?

The U.S. Census Bureau defines rural as what is not urban—that is, after defining individual urban areas, rural is what is left. Other federal agencies and researchers may use a different definition of rural. For example, the U.S. Department of Agriculture's Economic Research Service illustrates that there are several different ways to measure rural communities.¹

This brief highlights the history of delineating rural at the Census Bureau, the current delineations of urban/rural areas, and the relationship that exists between decennial censuses, the American Community Survey (ACS), and geography. Additionally, the brief categorizes counties based on three types of rurality and highlights the availability of ACS estimates.

Over the past century, the United States has experienced substantial urban growth. The suburbs around large cities have expanded, and in many areas account for a large proportion of an urban area's population and land area. Midsize cities and small towns have now grown into larger urban agglomerations. As urban areas and their populations have increased, the rural population has declined as a percentage of the total

¹ See Defining the "Rural" in Rural America available at <www.ers.usda.gov/amber-waves/2008/june/defining-the-rural-in-rural-america/> and "Rural Classifications" available at <www.ers.usda.gov/topics/rural-economy-population/rural-classifications/>.

population, from 54.4 percent in 1910 to 19.3 percent in 2010.² Changes to settlement patterns have necessitated periodic recalibrations in methods and definitions of what constitutes urban and rural.

"Statistics have been split into urban and rural categories in decennial census publications for over a century."³

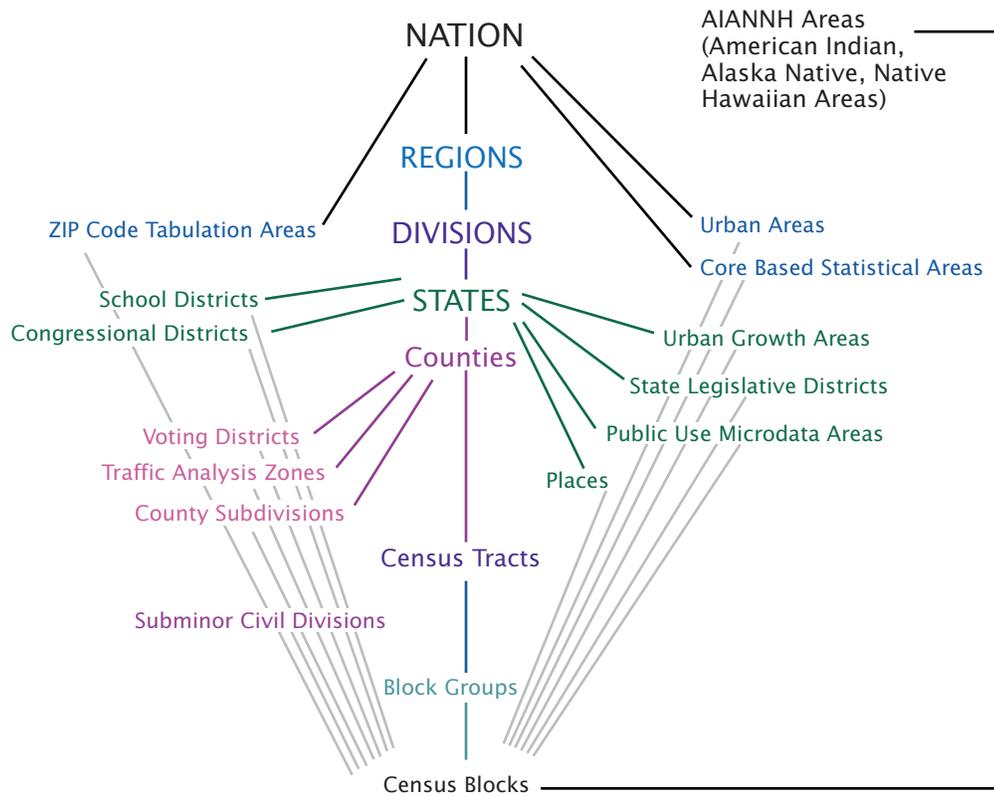
Geography plays a pivotal role throughout the collection and dissemination of data and statistics for the nation. For statistical measurement, it is necessary to subdivide the country into small geographic units. Figure 1 shows the standard Census Bureau divisions of geography and their relationships. Advancements in technology, like satellite imagery and computer-based mapping, have fostered new methods to collect essential data. The innovation and technological advancements in data collection aid our ability to create a more nuanced, yet uniform classification of urban areas.

The Census Bureau began identifying urban places in reports following the 1870, 1880, and 1890 Censuses. In the early part of the twentieth century, the Census Bureau adopted an official definition, identifying incorporated cities and towns with at least 2,500 people as urban. Population and territory outside of cities and towns with 2,500 or more people were considered rural. Definitions evolved over this period to reflect changing settlement patterns of the United States, but

² U.S. Census Bureau, 1910 to 1990 Censuses, <www.census.gov/population/censusdata/urpop0090.txt>; 2000 decennial census, Table P002; 2010 decennial census, Table P2.

³ A brief history of the Census Bureau's definitions of urban and rural areas is available at <www.census.gov/history/www/programs/geography/urban_and_rural_areas.html>.

Figure 1.
Standard Hierarchy of Census Geographic Entities



Source: U.S. Census Bureau, Hierarchy Diagrams, <www.census.gov/geo/reference/hierarchy.html>.

also in response to changes in data users' needs and technology.^{4,5} While the definition of urban has continued to progress to include more people and territory in the United States, the rural definition remains as all territory, persons, and housing units not defined as urban.⁶

Urban or Rural?

Deciding where to draw the line between urban and rural can be a complex task. Densely developed "downtowns" and sparsely populated areas are relatively easy to identify. Where does an urban area end as settlement patterns change from the city center to suburbs and beyond? The ambiguity of the urban area's edge is diminished with the application of standard measures.

The Census Bureau uses a definition based on population density and other measures of dense development when identifying urban territory. The definition seeks to draw the boundary around an urban area's "footprint" to include its developed territory. To accomplish this, the Census Bureau's definition of urban is largely based on residential population density and a few other land-use characteristics to identify densely developed territory.

⁴ Ibid.

⁵ See "Differences between the Final 2010 Census Urban Area Criteria and the Census 2000 Urban Area Criteria" available at <www2.census.gov/geo/pdfs/reference/ua/2000_2010uadif.pdf>.

⁶ For a detailed discussion of urban/rural historical definitions, see Michael Ratcliffe, "A Century of Delineating a Changing Landscape: The Census Bureau's Urban and Rural Classification, 1910 to 2010," presented at the Annual Meeting of the Social Science History Association, November 14, 2015, Baltimore, MD.

Starting with the 1950 Census, the Census Bureau began implementing criteria, through a uniform set of objective rules, which consistently define urbanized areas with a population of 50,000 or more. From 1950 through 1990, the delineation process was interactive, with geographers delineating boundaries “by hand” on paper maps (1950–1980) or in a geographic information system (1990). Technological limitations meant that the population density-based approach was applied only to urbanized areas with 50,000 or more people. Outside of urbanized areas, urban was defined as places with 2,500 or more people. Technological advancements, increased computing power, and data processing following the 1990 Census allowed the Census Bureau to extend the density-based approach to smaller clusters of the population, resulting in a consistent and seamless definition of urban areas with 2,500 or more people. To define an area as urban, the Census Bureau uses criteria including total population thresholds, density, land use, and distance. Census blocks are the “building blocks” for urban areas.

Population thresholds

In 2000, the Census Bureau expanded the classification to include two types of urban areas: urbanized areas and urban clusters. Urbanized areas are areas with 50,000 or more people. Urban clusters are areas with at least 2,500 but fewer than 50,000 people.⁷

⁷ A minimum of 1,500 people must reside outside of group quarters to classify an area as urban. More details about group quarters are available at <http://www2.census.gov/programs-surveys/acs/tech_docs/group_definitions/2015GQ_Definitions.pdf>.

Density

In order for a block to qualify as urban, it must have a density of 1,000 people per square mile (ppsm). Using an automated process, qualifying blocks are aggregated to form a central core area. Once the initial identification process is concluded, a second automated pass is initiated with a lower density threshold, 500 ppsm. This aids in identifying blocks that do not meet the initial density threshold, but may contain a mix of residential and nonresidential land use (parks, schools, commercial, retail, or industrial uses), and therefore should be included within the urban area.

Land use

Beginning in 2010, the Census Bureau used land cover and impervious surfaces (paved areas, such as parking lots) to help identify nonresidential urban land uses. Airports, for instance, are part of the urban landscape, but because they lack population density and tend to be located on the fringe of developed areas, they have not always been identified as a part of an urban area. An airport must have a minimum of 2,500 passengers annually and be located within a half mile of other qualifying territory to be included in an urban area.⁸ A block containing nonresidential urban land uses can be included if it has a high amount of impervious surface and is within a quarter mile of the urban area.⁹

⁸ In 2000, the criterion was a minimum of 10,000 passengers.

⁹ See “Differences between the Final 2010 Census Urban Area Criteria and the Census 2000 Urban Area Criteria” at <www2.census.gov/geo/pdfs/reference/ua/2000_2010uadif.pdf>.

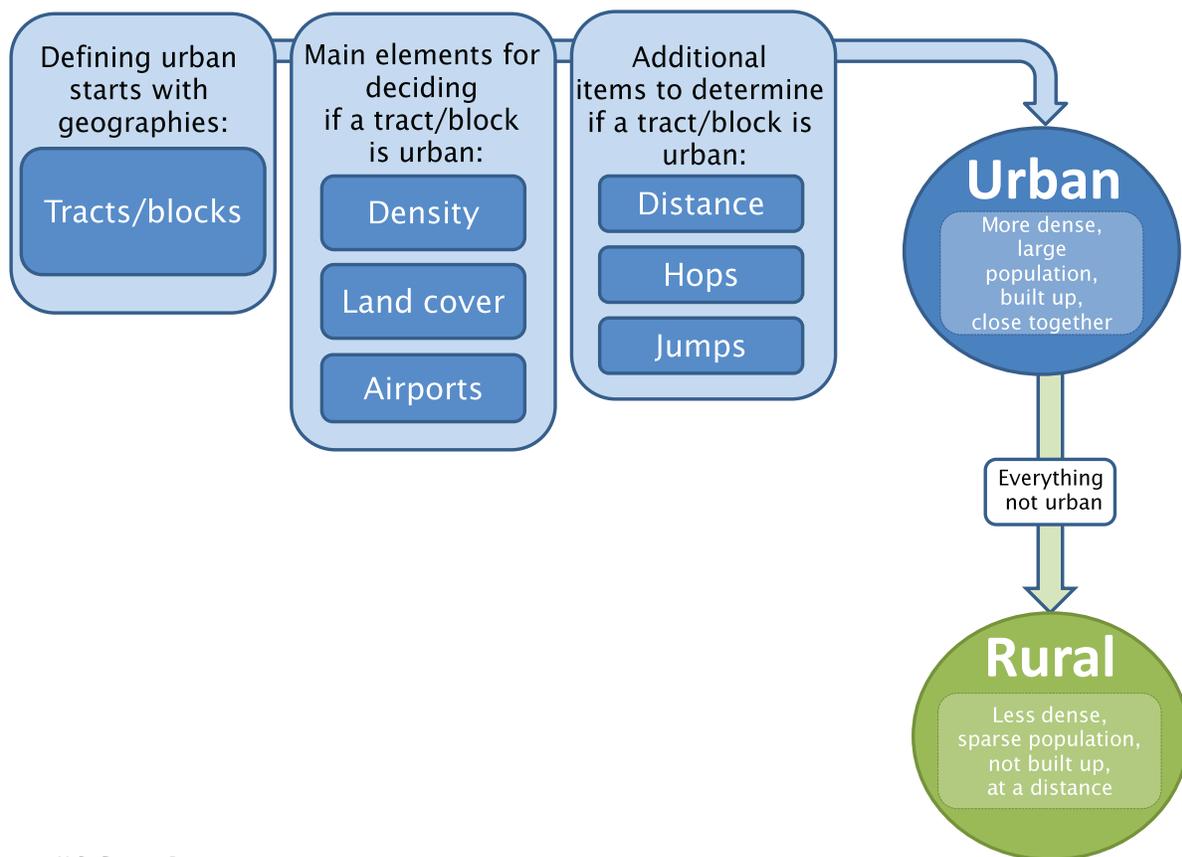
Distance

The Census Bureau recognizes that there are instances where urban development is not continuous, but perhaps should be included in a representation of an urban area. For example, a housing subdivision may be separated from other urban development by a large regional park, a shopping center or other commercial development, or even a small farm. In order to accommodate these real-world instances in patterns of urban development, *hop* and *jump* criteria are applied. The hop criteria allows for areas up to half a mile along a road corridor (with multiple hops) to be included. The jump criteria allows for the inclusion of areas up to 2.5 miles, but only one jump along a road.

Rural is defined as all population, housing, and territory not included within an urbanized area or urban cluster.¹⁰ As a result, the rural portion of the United States encompasses a wide variety of settlements, from densely settled small towns and “large-lot” housing subdivisions on the fringes of urban areas, to more sparsely populated and remote areas. Figure 2 illustrates the classification process.

¹⁰ Details about the Census Bureau’s urban and rural classification are available at <www.census.gov/geo/reference/urban-rural.html>.

Figure 2.
Graphic Depiction of Urban/Rural Classification



Source: U.S. Census Bureau.

In 2010, there were 486 urbanized areas and 3,087 urban clusters in the United States.¹¹ Urbanized areas contained 71.2 percent of the population, while 9.5 percent were within urban clusters. The rural areas of the United States contained 19.3 percent of the population. Urban areas and urban clusters (Figure 3), which contained the majority of the population, only occupied about 3.0 percent of the land area of the country.

¹¹ More details about 2010 Census urban areas are available at <www.census.gov/geo/reference/ua/uafacts.html>.

Does Rural Equal Nonmetropolitan?

The Census Bureau's delineation of urban areas and urban clusters provides the basis for the Office of Management and Budget's delineation of Core Based Statistical Areas or Metropolitan (metro) and Micropolitan (micro) statistical areas.¹² Metro and micro areas are nationally delineated for statistical purposes. Nonmetropolitan is often used synonymously with

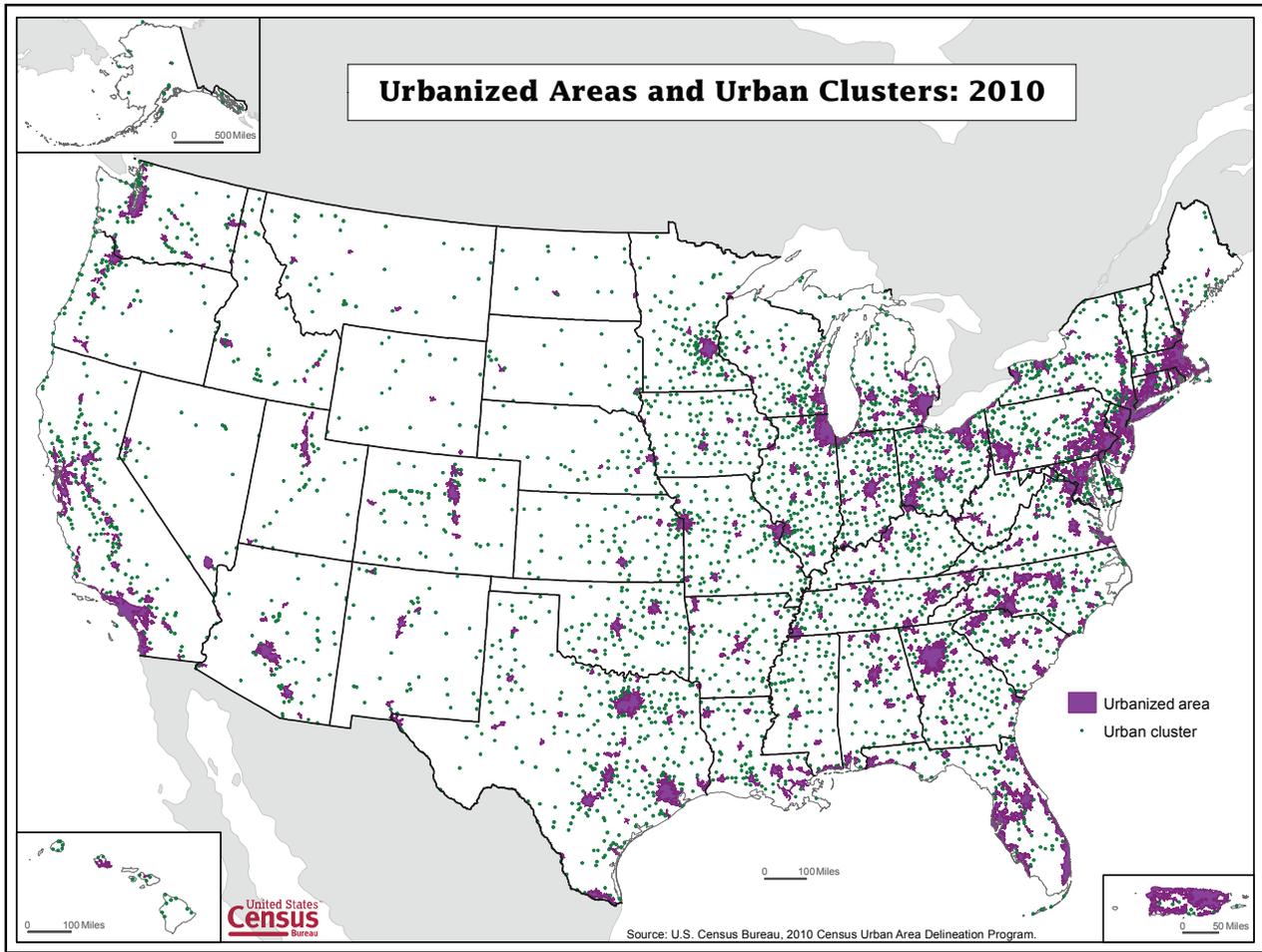
¹² See "2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas" at <www.whitehouse.gov/sites/default/files/omb/assets/fedreg_2010/06282010_metro_standards-Complete.pdf>.

rural, and while there is overlap, these geographic entities are not identical and should not be used interchangeably.

The Urban/Rural Population Spectrum

By using rules for creating divisions between urban and rural, it is possible to have peculiar outcomes in the classification. Since the urban/rural classification is built on blocks and tracts, a county's population can be a combination of urban and rural. A tract's population can also be split between urban or rural.

Figure 3.
Urbanized Areas and Urban Clusters: 2010



Core Based Statistical Areas (Metropolitan and Micropolitan Areas)

The delineations of urban and rural areas are used for statistical purposes to tabulate the population in the United States, including Puerto Rico and island areas. Additionally, the urban/rural delineation supports the Office of Management and Budget's (OMB) delineation of Core Based Statistical Areas (CBSAs) or metropolitan (metro) and micropolitan (micro) statistical areas. Urbanized areas with 50,000 or more people form the urban cores of metro areas. Urban clusters with at least 10,000 and less than 50,000 people form the urban cores of micro areas. Metro and micro areas are based on counties. However, the underlying geographies (urban areas and urban clusters) that are used to define CBSAs

are smaller and can be either urban or rural. Each metro or micro area must have one or more counties containing an urban core area. Additionally, adjacent counties with substantial social and economic integration to the urban core may be included.

In the United States, there are 381 metro areas and 536 micro areas defined by OMB. Metro and micro areas account for about 94 percent of the population, while the remaining 6 percent is nonmetro. The amount of land area in metro and micro areas is about 47 percent and the remaining 53 percent is nonmetro.

In this brief, we placed counties into three categories based on the percentage of the population that was rural as of the 2010 Census.¹³ The three rurality categories are: (1) completely rural, (2) mostly rural, and (3) mostly urban.¹⁴ Using the 2010 urban/rural definition, there are 704 counties or county statistical equivalents that are 100 percent or completely rural. These counties have no areas that are identified as urban and are home to less than 2.0 percent of the total U.S. population. Over 20 percent of the population living in these 704 completely rural

counties lives within a metro area (Table 1). Within the mostly urban counties, 29 counties have no rural population, meaning the counties are 100 percent urban. According to the 2010 Census, these 100 percent urban counties comprised about 3.5 percent of the total U.S. population. When combined, the 1,253 mostly urban counties contained about 266.6 million people or 86.3 percent of the total U.S. population in 2010.¹⁵

Counties were sorted based on the proportion of the population living in an urban or rural area in 2010. Table 2 shows the five most and least populous counties

within each rurality category and their respective percentage of the population living in rural areas. A wide range of population crosses each grouping. For example, completely rural counties range from 82 people in Loving County, TX, to more than 34,000 people in Lincoln County, ME. Stanley County, SD, provides a good example of the complicated nature of classifying counties as either mostly urban or mostly rural. Stanley County had a population of nearly 3,000, with 2,078 people residing in Fort Pierre, SD, the county's largest population center. Fort Pierre is located across the Missouri River from Pierre, SD, and is included in the Pierre urban cluster, which had a total population of 14,425 in 2010. With 57.5 percent of its population defined as urban, Stanley County is

¹³ This includes the United States only, not Puerto Rico.

¹⁴ Completely rural counties have a population that is 100 percent rural. Mostly rural counties have a population that is 50.0–99.9 percent rural. Mostly urban counties have a population that is less than 50.0 percent rural.

¹⁵ There were 1,253 mostly urban counties in the 2011–2015 ACS 5-year estimates, but 1,254 mostly urban counties in the 2010 Census. The statistics for Urban/rural split and metro/nonmetro split in Table 1 use data from the 2011–2015 ACS.

Table 1.
County Type by Percentage of Urban/Rural and Metro/Nonmetro

Type of county	Number of counties ¹	Percent of total population	Urban/rural split		Metro/nonmetro split	
			Percent urban	Percent rural	Percent metro	Percent nonmetro ²
Mostly urban	1,253	86.3	89.0	11.0	93.9	6.1
Mostly rural	1,185	11.9	33.1	66.9	31.3	68.7
Completely rural	704	1.7	0.0	100.0	20.2	79.8

¹ Number of counties or county statistical equivalents are based on 2011–2015 American Community Survey 5-year estimates. In 2013, Bedford city, VA, changed to town status and was added to Bedford County, decreasing the total number of mostly urban counties to 1,253.

² Nonmetro includes micropolitan areas.

Sources: U.S. Census Bureau, 2010 Census and 2011–2015 American Community Survey 5-year estimates.

Table 2.
Selected Most and Least Populous Counties by Rurality: 2010

	Completely rural			Mostly rural			Mostly urban		
	County	2010 Census	100 percent rural	County	2010 Census	50–99 percent rural	County	2010 Census	Less than 50 percent rural
Most populous	Lincoln County, ME	34,457	100.0	York County, ME	197,131	56.8	Los Angeles County, CA	9,818,605	0.6
	Accomack County, VA	33,164	100.0	Johnston County, NC	168,878	52.0	Cook County, IL	5,194,675	0.0
	Cass County, MN	28,567	100.0	Penobscot County, ME	153,923	57.7	Harris County, TX	4,092,459	1.2
	Cherokee County, NC	27,444	100.0	Merrimack County, NH	146,445	54.6	Maricopa County, AZ	3,817,117	2.4
	San Jacinto County, TX	26,384	100.0	Randolph County, NC	141,752	56.2	San Diego County, CA	3,095,313	3.3
Least populous	Arthur County, NE	460	100.0	Dewey County, SD	5,301	64.1	Hemphill County, TX	3,807	27.0
	Kenedy County, TX	416	100.0	Storey County, NV	4,010	92.6	Crockett County, TX	3,719	22.7
	King County, TX	286	100.0	Sierra County, CA	3,240	99.7	Kinney County, TX	3,598	20.5
	Kalawao County, HI	90	100.0	Ziebach County, SD	2,801	73.5	Reagan County, TX	3,367	13.3
	Loving County, TX	82	100.0	Quitman County, GA	2,513	73.1	Stanley County, SD	2,966	42.5

Source: U.S. Census Bureau, 2010 Census.

classified as mostly urban for this analysis, however, nearly all of the county's land area (99.9 percent) is rural. Stanley County is in the mostly urban category with large metro counties, such as San Diego, CA; Los Angeles, CA; and Cook, IL (Chicago). Stanley County provides a good example of the challenges of classifying counties based only on the percentage of a county's population that is rural.

Relating the Urban/Rural Definition to the American Community Survey

The definitions of urban and rural are updated every decade following the decennial census. The ACS uses these definitions to identify urban or rural throughout the decade. The urban and rural definitions are updated every 10 years, annual data from the ACS relies on existing definitions. Since this is the case, the ACS does not necessarily reflect a community's urbanization process.¹⁶ The new urban definition generally goes into effect in the ACS the second year following the decennial census and is used until the second year after the next decennial census (urban areas based on the 2010 Census were announced and available in 2012). Tables 3 and 4 summarize the geographic relationship between decennial census and ACS with regard to urban/rural delineations. In order to create the

¹⁶ Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on 2010 Census data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Table 3.
Geographic Relationship Between the Decennial Census and 1-Year ACS for Urban/Rural Areas

ACS 1-year	Census year	
	2000	2010
2005.....	X	
2006.....	X	
2007.....	X	
2008.....	X	
2009.....	X	
2010.....	X	
2011.....	X	
2012.....		X
2013.....		X
2014.....		X
2015.....		X

Source: U.S. Census Bureau, American Community Survey, Geographic Boundaries by Year, <www.census.gov/programs-surveys/acs/geography-acs/geography-boundaries-by-year.html>.

Table 4.
Geographic Relationship Between the Decennial Census and 5-Year ACS for Urban/Rural Areas

ACS 5-year	Census year	
	2000	2010
2005–2009.....	X	
2006–2010.....	X	
2007–2011.....	X	
2008–2012.....		X
2009–2013.....		X
2010–2014.....		X
2011–2015.....		X

Source: U.S. Census Bureau, American Community Survey, Geographic Boundaries by Year, <www.census.gov/programs-surveys/acs/geography-acs/geography-boundaries-by-year.html>.

Table 5.
Type of County and ACS Estimates Available

Type of county	Number of counties	Number of counties receiving:	
		ACS 1-year estimates	ACS 5-year estimates only
Mostly urban.....	1,253	729	524
Mostly rural.....	1,185	90	1,095
Completely rural.....	704	0	704

Source: U.S. Census Bureau, American Community Survey.

5-year ACS file, data are pooled and reweighted to the last year. As such, the most recent geography is applied to the entire 5-year file.¹⁷ It is recommended that data users interested in urban/rural data only compare nonoverlapping ACS 5-year datasets using the same definition of urban and rural. For example, the 2008–2012 ACS 5-year estimates and 2013–2017 ACS 5-year estimates will be the first nonoverlapping datasets that use the same 2010 urban/rural definitions.

Unlike ACS 1-year estimates that provide data for about one quarter of the counties in the nation, ACS 5-year estimates are available for all counties and county statistical equivalents (Table 5). Only 90 of the mostly rural counties receive 1-year estimates. The 704 completely rural counties, currently home to an estimated 5.3 million people, rely solely on ACS 5-year estimates.¹⁸

¹⁷ For more detail on the American Community Survey methods, see <www.census.gov/programs-surveys/acs/methodology/design-and-methodology.html>.

¹⁸ For a list of the counties in each one of the three rurality categories, see <http://www2.census.gov/geo/docs/reference/ua/County_Rural_Lookup.xlsx>.

Additional Information

Urban and rural classification

www.census.gov/geo/reference/urban-rural.html

www.census.gov/geo/reference/ua/urban-rural-2010.html

www.census.gov/geo/reference/ua/uafaq.html

2010 Census

Information on other population and housing topics is presented in the 2010 Census Briefs series located on the Census Bureau's Web site at <http://census.gov/library/publications.html>. This series also presents information about race, Hispanic origin, age, sex, household type, housing tenure, and people who reside in group quarters.

For more information on confidentiality protection, nonsampling error, and definitions, see www.census.gov/prod/cen2010/doc/pl94-171.pdf.

Metropolitan and micropolitan areas

For more information on metropolitan and micropolitan statistical areas, including concepts, definitions, reports, and maps, see www.census.gov/population/metro/.

Historical census data

www.census.gov/population/www/censusdata/hiscendata.html

American Community Survey

The American Community Survey (ACS) is a nationwide survey designed to provide communities with reliable and timely demographic, social, economic, and housing data for the nation, states, congressional districts, counties, places, and other localities every year. It has an annual sample size of about 3.5 million addresses across the United States and Puerto Rico and includes both housing units and group quarters (e.g., nursing facilities, college dormitories, and prisons). The 5-year file of the ACS is designed to provide reliable statistics for small populations and small geographical areas of the United States. For information on the ACS sample design and other topics, visit www.census.gov/programs-surveys/acs/.

Source and Accuracy

The data presented in this report are based on the ACS sample interviewed from January 2011 through December 2015. The estimates based on this sample describe the average values of people, households, and housing unit characteristics over this period of collection. Sampling error is the uncertainty between an estimate based on a sample and the corresponding value that would be obtained if the estimate were based on the entire population (as from a census). Measures of sampling error are provided in the form of margins of error for key estimates

included in this report. All comparative statements in this report have undergone statistical testing, and comparisons are significant at the 90 percent confidence level unless otherwise noted. In addition to sampling error, nonsampling error may be introduced during any of the operations used to collect and process survey data such as editing, reviewing, or keying data from questionnaires. For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, please see the ACS Multiyear Accuracy of the Data document located at www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html.

Contacts

If you have questions or need additional information, please call the Customer Services Center at 800-923-8282. You can also visit the Census Bureau's Question and Answer Center at <https://ask.census.gov> to submit your questions online.

Suggested Citation

Michael Ratcliffe, Charlynn Burd, Kelly Holder, and Alison Fields, "Defining Rural at the U.S. Census Bureau," ACSGEO-1, U.S. Census Bureau, Washington, DC, 2016.