

What is going on with Urbanized Area Boundaries?

Apologies for the long message, but the various e-mails to this list regarding Census Bureau urbanized areas seem to necessitate some historical background about the Census Bureau's urban/rural classification and urban area definitions. If you're not interested in the background and history, skip to the bottom of this message.

Purpose of the Census Bureau's Urban/Rural Classification

The Census Bureau defines urban areas solely to provide statistical data for urban and rural population and housing. Ever since the Census Bureau began distinguishing between urban and rural territory (urban places were first identified officially in 1910), the definition of "urban" has been based on decennial census counts of residential population and residential population density (with the exception of the delineation of urbanized areas for the 1950 census, which relied upon housing unit density). The Census Bureau has never attempted to take into account daytime population or worker counts when delineating urban places, urbanized areas, or urban clusters. This is probably the appropriate place to also point out that the Census Bureau defines urban areas and rural solely for the purpose of tabulating and presenting Census Bureau statistical data. Urbanized areas and urban clusters are not defined for non-statistical purposes (for instance, determining transportation funding); any organization using the Census Bureau's urban area definitions for non-statistical, programmatic purposes should take into consideration the specific needs of the program, the relationship between those needs and the Census Bureau's urban/rural concept, criteria, and delineation methodology, and make appropriate modifications. It is also worth noting that, despite the Census Bureau's statement that urbanized areas are defined solely for statistical purposes, a number of federal agency programs use our definitions as the basis for implementing funding programs and determining qualification for participation in programs. In addition to transportation programs, a number of health programs, urban and rural development and economic assistance programs, and environmental protection programs, rely upon the Census Bureau's urban/rural definitions. If criteria and delineation methodologies had to take into account all of the disparate uses of Census Bureau urban area definitions, the classification would soon become meaningless.

Background and History

Over the course of nearly 100 years of defining "urban," the Census Bureau has introduced conceptual and methodological changes to ensure that the urban/rural classification keeps pace with changes in settlement patterns, as well as to changes in theoretical approaches to interpreting and understanding the growth of urban areas. Periodic review of the urban/rural classification and criteria ensures its continued usefulness and relevance for statistical data tabulation and analysis, and ensures that the delineation process utilizes the best possible data, procedures, and methodologies. Prior to the 1950 census, the Census Bureau defined "urban" as any population, housing, and territory located within incorporated places of 2,500 or more population. That approach to defining "urban" is by far the easiest, simplest, and most straightforward to implement, requiring no calculation of population density; no need to understand and account for actual settlement patterns on the ground;

and no need to consider densely settled populations existing outside incorporated municipalities. For much of the first half of the 20th century, that definition was adequate for defining "urban" and "rural" in the United States, but by no means accurate.

Increasing suburbanization, particularly outside the boundaries of large incorporated municipalities, led to the adoption of the urbanized area concept for the 1950 census. In adopting this concept, Census Bureau geographers and demographers formally recognized that densely settled communities existed outside the boundaries of large incorporated municipalities, and were just as "urban" as densely settled population inside incorporated place boundaries. Given the nature of available technology for calculating and mapping density (basically, planimeters and paper maps), delineation of urbanized areas was limited to cities of 50,000 or more population and their surrounding territory; the geographic units used to analyze settlement patterns were enumeration districts, but to facilitate and ease the delineation process, each place was analyzed as a single unit-- that is, the overall density of the place was calculated and if it met the minimum threshold, it was included in its entirety in the urbanized area. "Urban" outside urbanized areas was still defined as any place (unincorporated "Census Designated Places" were now included along with incorporated places) with a population of at least 2,500.

Starting with the 1960 census and continuing through the 1990 census, the Census Bureau made a number of enhancements to the methodology and criteria for defining urbanized areas, but the basic definition of "urban" remained in place: urbanized areas of 50,000 or more population defined on the basis (for the most part) of population density; and urban places of 2,500 or more population located outside urbanized areas. Enhancements included:

1. Relaxation, and eventual elimination, of minimum population criteria for places that formed the "starting point" for delineation of an urbanized area
2. Identification of "extended cities"-- incorporated places containing substantial amounts of very low density (less than 100 people per square mile) territory, which were divided into urban and rural components
3. For the 1990 census, interactive analysis of population density patterns at the census block level, or by groups of blocks (known as "analysis units" and not to be confused with block groups) using Census Bureau-developed delineation software. This allowed greater flexibility when analyzing and defining urbanized areas, as opposed to using enumeration districts and other measurement units defined prior to data tabulation
4. Qualification of places for inclusion in an urbanized area based on the existence of a densely populated "core" containing at least 50% of the place's population.

Changes for Census 2000

The Census Bureau adopted two substantial changes to its urban/rural classification for Census 2000. These included:

- 1) Defining urban clusters of at least 2,500 and less than 50,000 people using the same residential population density-based criteria as applied to urbanized areas. As a result of this change, the Census Bureau no longer identified "urban places located outside urbanized areas."
- 2) Ignoring incorporated place and census designated place boundaries when defining urbanized areas and urban clusters. Implementation of this change meant that low density, obviously rural territory that happened to be located inside place boundaries (due to annexation, perhaps) no longer, necessarily qualified for inclusion in an urban area. However, it also means that non-residential urban land uses located inside a place's boundary and located on the edge of an urban area may not necessarily be located in an urbanized area or urban cluster (as several people on this thread have pointed out).

These two changes provided for a consistent approach to defining urban areas throughout the United States. Taking place boundaries into account in previous decades resulted in the inclusion of low density territory and population within urbanized areas when the place as a whole met minimum population density requirements, and excluded densely settled population when the place as a whole fell below minimum density requirements. Also, the lack of a density-based approach for defining urban areas of less than 50,000 people resulted in underbounding of urban areas where densely settled populations existed outside place boundaries. States in which annexation had lagged behind expansion of densely settled areas, or in which communities of 2,500 up to 50,000 were not incorporated or were not defined as census designated places, were most affected by the adoption of density-based urban clusters. The attached paper describes the changes adopted for Census 2000 and the effect on delineation of urban areas.

Adoption of density-based approach for defining "urban" at all levels required a change in methodology. The Census Bureau's Geography Division did not possess sufficient resources to have geographers interactively review and delineate thousands of potential urban areas in 2000 (for the 1990 urbanized area program, approximately 50 geographers at headquarters and the regional offices spent six months interactively reviewing population density patterns for 600 potential urbanized areas, resulting in 405 qualifying urbanized areas). Therefore, successful and timely completion of the Census 2000 urban area program required an automated approach to delineation. Compared to previous decades' urban area definition programs, development of automated software that resulted in definitions that were reasonably consistent with previous decade's definitions, was hardly the easiest and most straightforward approach. But, it did offer the advantage of consistency. Compared to previous decades in which individual geographers applied and interpreted delineation criteria when analyzing and defining urbanized areas in the portions of the country assigned to them, the automated delineation software applied the criteria evenly and consistently throughout the United States, Puerto Rico, and the Island Areas.

Considerations for 2010 and/or Beyond

Although it is too early to discuss potential criteria for defining urbanized areas and urban clusters for the 2010 Census, we can identify a few issues that staff are currently researching:

- 1) We are investigating the potential for use of place of work data to identify areas with low residential population densities, but relatively high worker densities, to augment delineation based on residential density.
- 2) We are reviewing the availability and applicability of nationwide datasets containing land use/land cover information. While we have recognized the desirability of using land use/land cover data when delineating urbanized areas, we have been hampered by the lack of a consistent, comprehensive data set for the U.S. in which the reference date for the data is relatively consistent and is relatively close in time to Census Day (in other words, we don't want to use old data, nor do we want to use data calibrated to different dates for various parts of the country). For the Census 2000 urban area delineation program, we did make use of a FAA file containing information about the nation's largest airports to help ensure that major airports were included in urbanized areas when adjacent to qualifying territory.
- 3) We are investigating the potential use of digital elevation data to identify steeply sloped areas that may offset urbanization.
- 4) We are investigating the potential use of housing unit density instead of population density to facilitate intercensal updating of urban area definitions. The American Community Survey has presented demographic characteristics and population estimates for urbanized areas of 65,000 or more people, and with the upcoming 3-year estimates, will produce data for all urbanized areas as well as urban clusters of 20,000 or more population. These estimates are based on Census 2000 urban area boundaries, and do not reflect urbanization that has occurred since 2000.
- 5) We are investigating the potential use of different building blocks for urban area delineations; specifically we are investigating the use of census tracts and blocks instead of block groups and blocks. The use of census tracts in urban area definition would potentially allow the use of place-of-work and commuting data in initial urban area core definition, and refine the urban area split process.

We currently anticipate publishing potential criteria for defining urbanized areas and urban clusters in **Fall 2009 in the Federal Register**. We are aware of the transportation community's interest in the Census Bureau's urban area classification, and will keep folks informed via the CTPP list as well as other listserves and venues as work progresses.

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