

Delivering What Users Want: the Evolution of Census Bureau Small Area Dataⁱ

Michael S. Snow, Ph.D.¹

¹U.S. Census Bureau, History Staff, 4600 Silver Hill Road, Washington, DC 20233

Abstract

Increasing demand for small area data has driven the expansion of the decennial census since the late nineteenth century. Responding to public health officials' need for data on relatively homogeneous units, the Census Bureau began tabulating data on subdivisions of a few cities in the 1890s. When social workers and business organizations joined public health officers in asking the Census Bureau for such data, the agency agreed to publish data based on their delineation of census tracts. To meet growing demand from marketers and government planners, the Census Bureau added data on census blocks in 1940 and later on other geographic entities aggregated from blocks. Since the 1970s, the need for small area data for legislative redistricting pushed the agency to extend nationwide the areas for which it provided small area data. The most recent evolution has arisen out of calls for more timely data. The American Community Survey in 2010 replaced the decennial long-form and began delivering small area data more than once a decade.

Key Words: census tract, small area data, redistricting, public health, marketing

The year 2010 marked a watershed in the history of the U.S. Census. In that year, the Census Bureau released the first American Community Survey (ACS) estimates designed to provide data comparable to those produced by the decennial census long form used for Census 2000 and previous censuses. The advent of the ACS signaled a change in the methodology and design underlying the collection of detailed information on population and housing characteristics for the nation's communities, a responsibility that the Census Bureau had shouldered increasingly at the behest of data users since the 1890 census.ⁱⁱ This change had potentially far-reaching consequences. For decades, a growing number of people and institutions had sought more timely data for small areas than those provided by a once-a-decade decennial sample survey.¹ Before the advent of the ACS such data users turned to their own surveys, when they had the funds, or turned to

ⁱ The views expressed in this paper are those of the author and not necessarily those of the U.S. Census Bureau.

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administrative records, which they frequently found lacking sufficient demographic details. At the same time, the costs of conducting the decennial survey had risen as the complexities associated with data collection for a diverse population had increased. The Census Bureau's response to these challenges was to launch a new design for its long-form survey based on a continuous data collection process that was decoupled from the once-a-decade census enumeration. This design made it possible to produce more current information than had ever been possible on a nationwide basis, while at the same time enabling the agency to focus fully on the critical enumeration of the Nation's population during the census year. After more than ten years of testing, the first ACS data products were released in 2006 and provided data for areas of 65,000 or more. Five years later, the first data products with comparability to those of the survey the ACS had replaced were released, and the public had its first access to ACS data for small areas. While reactions to these data varied, broadly speaking, the government agencies and private-sector organizations that had always thrived on long-form survey data of the past embraced the ACS data for small areas. In addition, with the release of the first ACS 5-year estimates, communities that had previously relied on outdated census data to make critical decisions for allocating resources, or that had paid for supplemental local surveys to update census information could begin to take advantage fresh data every year from a new national survey conducted by the U.S. Census Bureau. As the following pages will show, the Census Bureau's implementation of the ACS was part of a long line of responses by the agency to data users' needs. As both the number of users and the number of types of users of small area data grew, their demand played a central role in the Census Bureau's adoption of new geographic entities and expansion of data it published.

Early Attempts to Expand Data Products: the 1880 and 1890 Censuses

Before the twentieth century, few people or government entities made much use of census data below the level of states. The major use of small area data was by civic boosters boasting of the size or growth rate of their municipalities or counties.² The last two censuses of the nineteenth century, however, broke new ground when public health officers succeeded in persuading the Census Office to publish summary details of cities broken down into political districts. Since 1875 the American Public Health Association (APHA) had been calling for a national survey of sanitation.³ Waste disposal and overcrowding in housing were major concerns. For the 1880 census, the Census Office hired John Shaw Billings and George E. Waring, Jr. to oversee the collection of data on death rates and the social statistics of cities. The two men were fresh from their work on the National Board of Health's survey of sanitary conditions in Memphis in the aftermath of a yellow fever outbreak there. The reports that Waring and Billings compiled for the 1880 census expanded that work from Memphis to a few more cities before funding ran out. The Census Office published statistics on population, the number of dwellings, amount of marshlands, and total land area broken down by political wards for a handful of cities. Small area variations within most of the nation's growing cities were buried in citywide summaries. Billings saw room for improvement and called for the study of public health to be taken down to the neighborhood level in his presidential address to the APHA in 1880.⁴

The Census Office appears to have agreed with that sentiment when it hired Billings in 1889 to oversee the Vital Statistics Division.⁵ Billings and his team greatly expanded what the Census Office published in terms of the number of cities for which the 1890 census reported small area data. A special census report featured 27 cities for which it broke out headcounts by ward, population density, and death rates.⁶ The Census Office

also published a smaller number of special reports on major cities for which agents from Billings's division, with advice from local health officials, had subdivided wards into "sanitary districts" purported to have uniform housing and population characteristics (see Figure 1).⁷ For these cities, the publication reported major cause of death by age, sex, immigration status, and even by Irish and German immigrants in each ward.⁸ Under Billings's supervision, census clerks assembled death records from city coroners, hospitals and public health agents for six years preceding 1890 and assigned each death to the deceased's ward or district of residence. The primary purpose of the Billings study was to investigate the effects of ethnic heritage, population density, climate, and drainage on diseases in order to build programs, such as housing codes, to eradicate them.⁹

From 1910-1945, Newly Available Census Tract Data Used by Social Welfare Agencies, Local Businesses, and Governments

Researchers interested in Billings's ward-level data found them inadequate and, in the first decade of the twentieth century, developed a more useful data field from which to aggregate data.¹⁰ Rev. Dr. Walter Laidlaw, a Presbyterian minister, was doing research to help New York City's churches. He wanted to help them figure out which congregations would find their parishioners displaced by business and industries and which would need to change their recruiting and outreach to accommodate new residents from different ethnic and occupational backgrounds.¹¹

Directing research for the New York Federation of Churches, Laidlaw found that he could not compare the same areas over time because New York State changed the boundaries of election districts in 1905.¹² He suggested dividing cities into more permanent geographic units for study. The New York City Tenement House Department seconded Laidlaw's suggestion and recommended creating districts that were relatively homogeneous in terms of ethnic groups and types of housing.¹³ The Tenement House Department even asked that data be tabulated for each of the city's 49,000 blocks, but the Census Bureau, renamed when the Census Office became a permanent federal agency in 1902, argued that the burden on it would be too great. Under Laidlaw's lobbying, the Census Bureau agreed that the next decennial census (1910) would collect data using a new unit (eventually called a "census tract") for New York City and would make the initial tabulations, but it would leave preparation of final tables based on these data and their publication to interested groups. The Federation of Churches paid \$60,000 [\$1.4 million in 2010 dollars] for the Census Bureau's tabulations for New York City and to publish the tables and an accompanying study.¹⁴ On the study's release date, the Federation of Churches encouraged churches to aid the "new immigrants" whose numbers the study documented.¹⁵ The 1910 and 1920 censuses also tabulated basic tract data for the eight largest cities, but these data elicited little interest for several years.¹⁶

That level of disinterest would change largely based on the work of Howard Whipple Green. Green, the secretary of the Cleveland Health Council, heard of Laidlaw's work in 1926 and raised money to pay for the final tabulation of tract data for Cleveland from 1910 and 1920. Green also delineated tract boundaries in adjacent suburbs, becoming the first person to do so. Green's intent was to provide evidence to organizations about where they should concentrate efforts to prevent the spread of tuberculosis and reduce infant mortality.¹⁷ Green presented Cleveland's tract data to other social workers who began laying out tracts in their cities. Green's outreach coincided with the rise in popularity of the work of Sociologist Ernest W. Burgess. Burgess and his students argued that cities could be understood by studying the zones of activity and neighborhoods within them.¹⁸

In time for the 1930 census, census tract committees in eighteen cities had delineated tracts, won the Census Bureau's approval of their tracting, and raised money to pay for tabulations.¹⁹

In the 1930s, representatives from social welfare charitable groups continued to figure prominently in the ranks of potential users urging the collection of small area data. They were joined by an increasing number of officers from state and municipal governments in pressing the Census Bureau to recognize and tabulate data for tracts in their cities. Seven employees of municipal governments together with an equal number of state employees served as the leaders of census tract committees in 1937.²⁰

State and local governments willingly devoted months or years of staff time to laying out tracts in part because of the growing scope of municipal activities. Between 1912 and 1927, for example, municipal expenditures in cities with populations over 100,000 swelled from \$690 million to over \$2.5 billion [\$15.4 billion to \$31.3 billion in 2010 dollars].²¹ New Deal programs responding to the Great Depression greatly expanded federal aid to cities and states. Federal, state, and municipal emergency and unemployment relief in 1929 was estimated at around \$80 million; by 1934 it exceeded \$2.5 billion [\$1 billion to \$40.7 billion in 2010 dollars].²² Cities, counties, and states also received New Deal monies to build public works. Prodded in part by this flow of funds, interest in using small area data had spread so much that Green and Leon Truesdell, the Census Bureau's chief statistician, published a manual in 1934 establishing guidelines for city committees to draw tract boundaries. Green and Truesdell noted that census tract data were "invaluable for unemployment relief and other emergency activities."²³ Beyond relief planning, cities used small area data when planning where to situate the facilities and services they had started expanding between 1912 and 1927 and continued to build with federal aid in the 1930s. Speaking to the Convention of Local Planners in 1939, Vergil Reed, an assistant director of the Census Bureau, said that census tract data would show planners which areas had the population growth to warrant new facilities and the likely future tax base to pay for them.²⁴ Truesdell, Green, and the heads of tract committees from 64 cities then convinced the Census Bureau to publish data for all cities that had been tracted in time for the 1940 census and assume the costs.²⁵

From the mid-1930s onward, the spread of statistics to business uses brought with it a demand for even more details for small areas and data for areas even smaller than tracts. By 1934 business users of small area data included real estate boards, street railways, and companies selling cars, refrigerators, and natural gas.²⁶ In response to numerous mid-thirties requests to "furnish intra-city business tabulations" on population and business sales broken down by "market areas," the Census Bureau worked with business groups to see whether it would be feasible to release data from accumulations of blocks or block frontages. However, in 1936, it said that it might not be able to disclose information for that small an area. In some places, special tabulations for that small an area could lead to the danger the Census Bureau would disclose information on an individual entity and thereby violate laws requiring the confidentiality of responses.²⁷

Vergil Reed suggested to businesses ordering special tabulations of combinations of sets of enumeration districts and/or minor civil divisions. A business, Reed argued, could purchase such tabulations for "market areas" that it defined as matching the extent of its sales area or the market for its services.²⁸ Radio stations did just that paying for census tabulations by enumeration district to report to the Federal Communications Commission how many households lived "within certain intensity bands"²⁹

Depression-era statisticians additionally used small area data for sampling frames and probability sampling.³⁰ As a later generation did in the 2000s with the American Community Survey, politicians in the 1930s authorized sample surveys to meet the need for intercensal data when they found a mid-decade census too costly and politically unfeasible.³¹ The Works Progress Administration (WPA) responded to the need to see how aid programs had changed conditions when it launched the Sample Survey of the Unemployed in 1940. It selecting for interview households from every nth block in urban areas and selecting ones in rural areas from every nth section of townships.³² When the Census Bureau took over that survey it added weighting to the samples – samples from a given small area were weighted based on the frequency in the total country of small areas of similar characteristics.³³ Marketing firms in the 1930s and 1940s drew their samples in a similar fashion and checked the representativeness of the small areas for which they chose their samples versus national, statewide, or metropolitan population.³⁴ Responding to this demand for population data for survey sampling and to business users, the Census Bureau in 1940 created what amounted to a work around. It assumed the cost of preparing limited housing information on blocks in 191 cities of 50,000 or more inhabitants.³⁵

Population Movement Drove Extension Beyond Central Cities, 1946-1964

Rapid population growth after World War II expanded local governments' use of census data to plan where to build facilities in newly urbanized areas. Much as they had used small area data in the 1930s, city, county, and state governments drew upon tract data when extending sewer lines, building new roads, and approving proposed locations for hospitals and shopping centers.³⁶ More prominently, local government officials used small area data on the population of tracts combined with the number of children of pre-school age to project upcoming school enrollments to decide where to site new schools.³⁷

Commercial use extended as well. Bus companies used small area data when planning stops in growing areas and eliminating them or changing routes to express lines in shrinking neighborhoods.³⁸

Demand for data on the edges of cities led the Census Bureau to allow the extension of “tracting” to cover entire metropolitan areas. In fiscal year 1948, the Bureau of the Budget (BoB) with advice from the Census Bureau and other federal agencies to define standard metropolitan areas (SMAs). The agencies defined a metropolitan area as a county containing a central city of 50,000 or more population and one or more whole adjacent counties (or their statistically equivalent units). (BoB, later renamed the Office of Management and Budget (OMB), has modified their definitions several times since then.)³⁹ In the 1920s and 30s the Census Bureau had discouraged tract committees from setting up tracts outside central cities, but populations movements pushed it to reverse that position. Almost all tract committee heads surveyed in 1944 had expressed an interest in extending tracts to cover entire metropolitan districts. The Census Bureau encouraged them to do so in the 1950s. Tract committees brought the total number of entirely tracted SMAs to 133 and nearly doubled the number of tracts for which the Census Bureau tabulated data in the 1960 census (see Table 1).⁴⁰ This gave planners and marketers anxious to make population projections in such metropolitan areas data delineated down to smaller areas with which to work.

City planning agencies after World War II ramped up their urban redevelopment efforts to compete with the suburbs and thereby became major users of census small area data. Illinois' legislators in 1947 gave redevelopment commissions the power to redevelop areas identified in part based on factors census takers had identified in 1940 -- the number of dwellings lacking of proper plumbing or in a state of disrepair, number of inhabitants per bedroom, among others.⁴¹ Illinois also created one of the earliest laws to mandate the use of census small area data. Under its 1953 law a redevelopment agency had to show that at least 50 percent of the targeted area's housing was more than 35 years old.⁴² The Pittsburgh Planning Commission's study and plans for the city's North Side gave examples of how planners used census data (see Figure 2). It recommended for clearance one portion of the neighborhood based in part on the area's overcrowding (calculated from the 1950 census figures for the number of dwellings per census block and percentage of dwellings having more than 1.51 persons per room).⁴³

As with urban redevelopment, highway planning boosted the need for small area data. The Federal Aid Highway Act of 1956 transformed the urban landscape by authorizing the federal government to assume 90 percent of the cost on the construction of 5,300 miles of urban freeways.⁴⁴ By the mid-1950s, state highway departments were using census tract data to conduct origin and destination surveys.⁴⁵ Between 1950 and 1954, urban and regional planning bodies authored over a hundred publications using block or tract data.⁴⁶ According to Conrad Taeuber, assistant director of the Census Bureau, planners and others led the Census Bureau to publish limited population data by blocks in the 1960 census along with the housing data previously provided.⁴⁷ The Federal Highway Act of 1962 required planning using census block population data for any project in an urbanized area.⁴⁸

As the use of sampling and computers spread throughout the economy, businesses and marketing firms greatly expanded the scope of their use of small area data. For instance, in 1961 the president of the Real Estate Research Corporation cited upwards of 10,000 private clients for whom his firm helped identify investment opportunities using census data from enumeration districts.⁴⁹ The president of the International Association of Cross Reference Directory Publishers, told Congress in 1962 about using small area data because mailings might run as high as 5-20 million families.⁵⁰ Census officials made it clear to marketers in the early 1960s that it had extended its publishing to accommodate their demands. Census Bureau Assistant Director Morris Hansen cited marketers as the group demanding small area data the most and the chief driver behind the decision to present "statistics by blocks not only for the 300 cities of 50,000 or more inhabitants but also for 170 smaller places."⁵¹ By publishing limited population statistics by blocks, the Census Bureau in the 1960 census greatly eased marketers and other users' access to statistics for which they would have previously had to pay for special tabulations.⁵² By the late 1960s the Census Bureau was exploring with marketing associations to determine how it could provide data based on ZIP codes since their business clients recognized these units more readily than they did census tracts or blocks when examining population data.⁵³

Increased Demands for Data to Document Programs and Communities, 1964-1975

Civil rights laws, court decisions, and antipoverty programs greatly expanded the scope of small area data needed to qualify for funds, assess program effectiveness, and/or monitor compliance. For instance, cities had to create community profiles of the inner city neighborhoods for which they wanted to set up community action programs under the Economic Opportunity Act.⁵⁴ The use of small area data in New Haven served as an experiment later taken nationwide. There, in an effort to test the effectiveness of several Great Society programs, the Census Bureau proposed getting the needed data from a full mid-decade census or a smaller sample survey.⁵⁵ Because the proposals were not approved, the Census Bureau, other federal agencies, and local governments developed methods to match state and local administrative records with census data at the block level in order to determine if these programs actually had reduced poverty rates and improved health outcomes in New Haven's program areas.⁵⁶ They developed computer software (ADMATCH) to match state and local administrative records with census data at the block level. They also introduced geocoding to civilian applications and created Geographic Base File/Dual Independent Map Encoding (GBF/DIME), a system to automate the creation of geographic information systems. Users found so much value in the study's data linkages that the Census Bureau extended the GBF/DIME system to 80 other urban areas for the 1970 census.⁵⁷

Use and Accessibility Extends In Response to Federal Needs, 1970-2010

Since the late 1960s the increase in blocks and tracts has been driven by the federal government's need for data. The one person one vote doctrine meant that states had to make their legislative districts roughly equal in population, and the Voting Rights Act meant they had to pre-clear redistricting plans with the Department of Justice. Together these two developments meant that small area data usage for redistricting exploded in the 1970s.⁵⁸ Legislators, governors, and other officials flooded the Census Bureau in 1970-71 with 1,200 phone calls a month asking for data. The Census Bureau responded with voluminous printouts and "bed sheet" sized maps.⁵⁹ In addition for the 1980 census, five states entered into contracts to draw block areas for all areas of the state not covered by the Census Bureau's block program.⁶⁰ Following its 1983 meeting with representatives of the Department of Justice and both major political parties, the Census Bureau agreed it would extend tracts and blocks nationwide and make block group data available for the entire United States for the 1990 census. (see Table 2).⁶¹

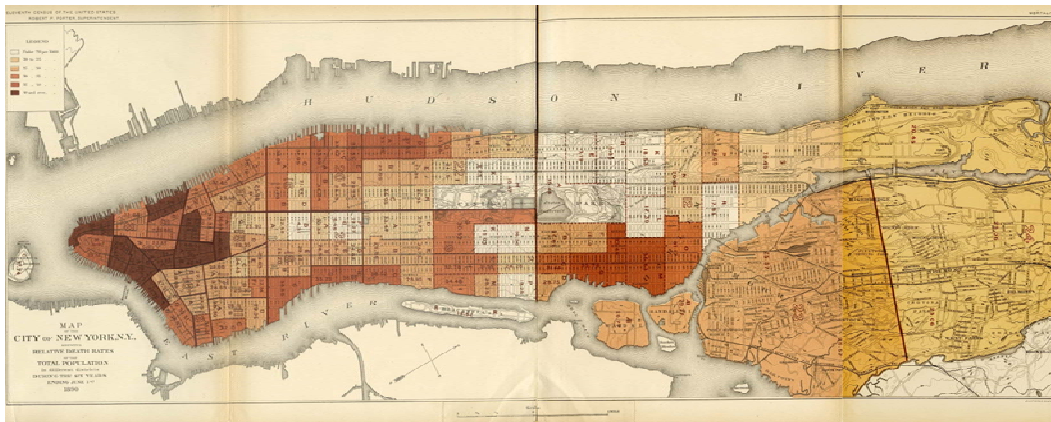
From the 1970s to the 1990s, the Census Bureau also moved to make data more accessible to small area data users as the nationwide extension of blocks, tracts and their equivalent units led to new uses for the data. The start of the 1970s saw a modified rollback of Great Society programs, but, in large measure, the federal government's return of authority to the states merely shifted more of the demand for small area data to them. In place of Great Society programs in which inner city neighborhoods ran programs with federal funds, the federal government returned tax monies it collected to states and cities. President Richard Nixon's revenue sharing programs distributed federal tax revenues back to some 39,000 local and state governments. Even the smallest minor civil divisions became dependent on census population data and income data to receive their allocated funds.⁶² Meanwhile, the federal government continued grants in aid and other programs with eligibility and/or allocation of funds based on small area data. These included the 1980s' Urban Development Action Grants and HUD Low Income Housing credits.⁶³ To meet the needs of these users, from the 1970s to the 1990s, the Census Bureau moved

from providing summary tape files of small area data to CD-ROMs and downloadable files.

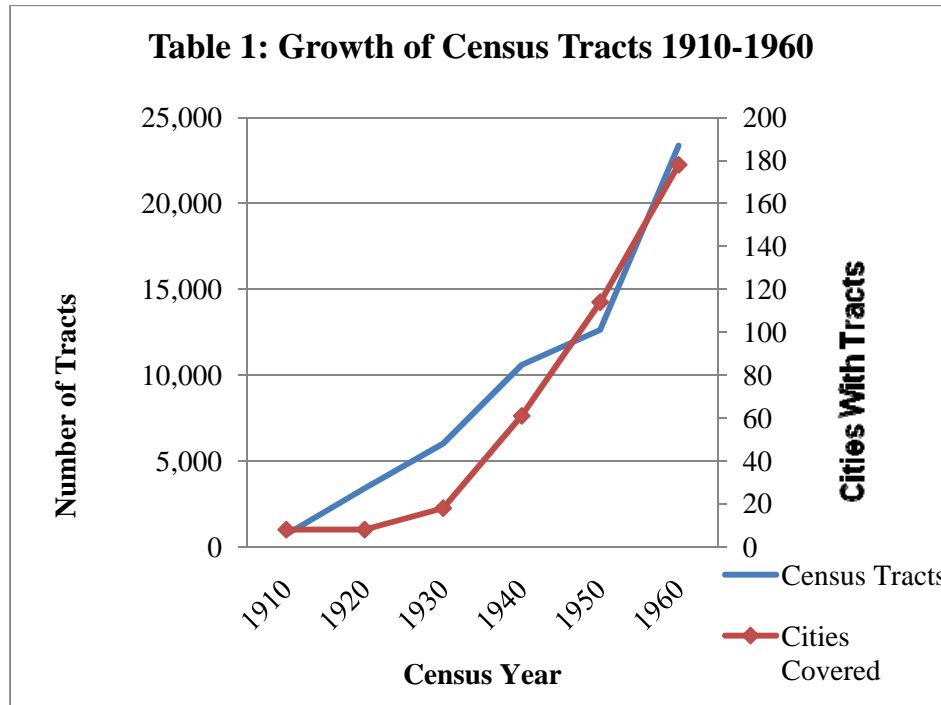
Conclusion

By the late 1980s, planners within the Census Bureau sought to simplify the decennial census in order to run a mid-decade census or a survey delivering data more frequently and sooner after it was collected. Cost concerns and a desire to reduce the burden on respondents drove a number of stakeholders following the 1990 census to back alternative designs for 2000. Several of those designs might have dropped the long-form sample questionnaire entirely with no replacement or reduced the content on the questionnaires. In response users lobbied Congress pointing out that, for many small businesses and small towns, Census Bureau data was the only source available or affordable to them for their planning. In response, the Census Bureau created a prototype for what became the American Community Survey (ACS) with a sample size large enough to derive estimates for census tracts and block groups. Throughout the creation of the prototype of the ACS and its field testing from 1995-2003, the Census Bureau consulted with small area data users. One issue they raised was that, while the survey would bring more frequent release of data versus the decennial sample survey, the estimates produced would have higher sampling errors. In 2010, the Census Bureau reconfigured the 210-year-old decennial census, reshaping the long-form sample into the ACS to provide small area data every year throughout the decade. It also continued exploring with small area data users ways to improve on the reliability of those estimates. In creating the ACS and seeking to improve it, the agency kept to its long tradition of responding to the growing demand of small area data users by innovating in data collection and dissemination.

Figure 1. Map of Billings's Sanitary Districts in Manhattan

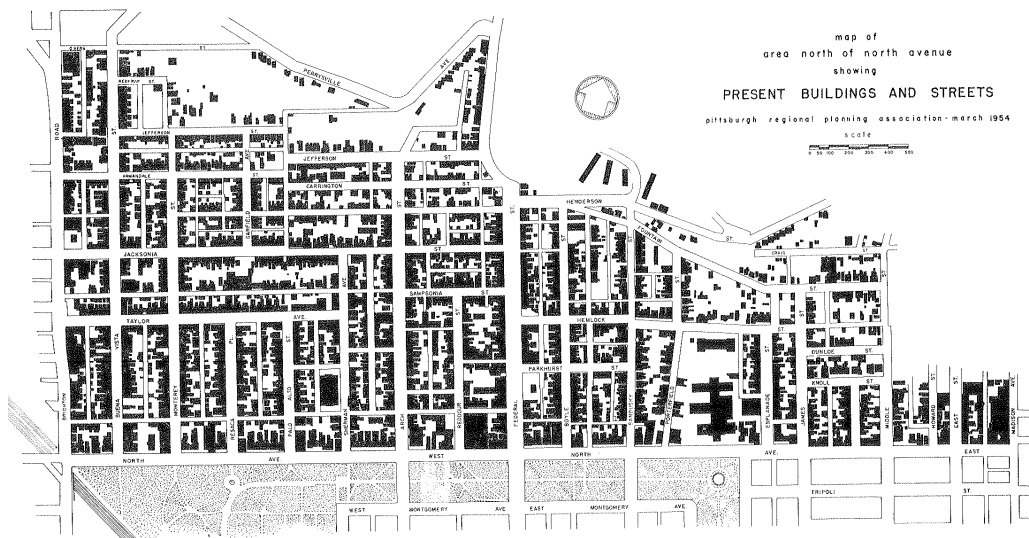


Source: John Shaw Billings, *Vital statistics of New York city and Brooklyn: covering a period of six years ending May 31, 1890*, Washington, D.C.: GPO, 1894, p. 164



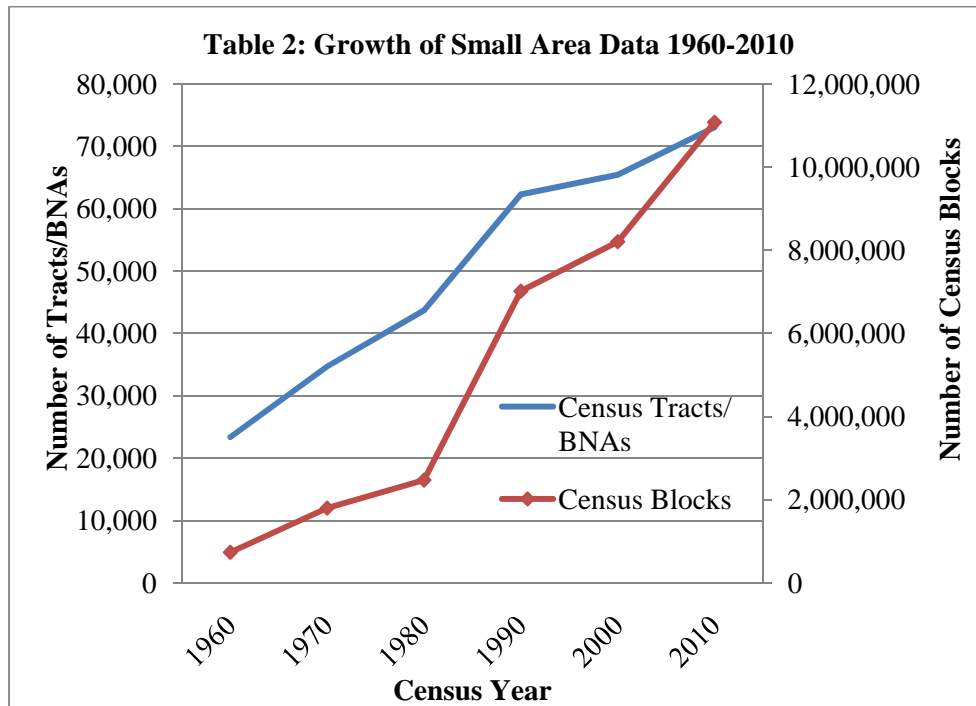
Source: Swift, "Dr. Laidlaw's Vision," 1956 and Census Bureau, Census Tract Manuals. 1934-1966

Figure 2. Portion of Pittsburgh's North Side Showing Housing and Surface Streets in 1954



Urban planners used maps such as the one above as a graphic representation of the overcrowding that they had uncovered in census data on areas to be redeveloped.

Source: Pittsburgh Regional Planning Association and the Pittsburgh City Planning Commission, "North Side Study," April 1954, p. 44.



Sources: U.S. Census Bureau, *1960-2010 Census of Population and Housing Histories*

¹ The definition of small area data, used throughout this paper, as being statistics for geographic areas below the level of counties or cities is taken from a paper by Marshall Turner and Frederick Bohme. This paper uses Turner and Bohme's delineation of periods from their history of the role advances in tabulation technology have played in the expansion of the number of geographic areas for which the Census Bureau published data. Nancy Krieger gives a great overview of changes in the use of census tract data public health. Marshall L. Turner, Jr., and Frederick G. Bohme, "The National Census: The Parts Are Greater Than the Whole," Paper prepared for presentation at the Social Science History Association annual meeting, November 5-8, 1992 and Nancy Krieger, "A Century of Census Tracts: Health & the Body Politic (1906-2006)," *Journal of Urban Health*. Vol. 83 No. 3, (May 2006): 355-361

² Turner and Bohme, pp. 5-10. And Carroll Wright, Commissioner of Labor and William C. Hunt, Chief Statistician, *The History and Growth of the United States Census*, (Washington, D.C.: GPO, 1900). And Turner and Bohme, pp. 5-10.

³ Walter F. Willcox, "The Past and Future Development of Vital Statistics in the United States: I, John Shaw Billings and Federal Vital Statistics," *Journal of the American Statistical Association*, Vol. 21, No. 155 (Sep., 1926), p. 258.

⁴ Francis A. Walker, *Report of the Superintendent of the Census to the Secretary of the Interior, 1881*, (Washington, D.C.: GPO, 1881), 11 and Fielding H. Garrison, M. D., "The Scientific Work of Dr. John Shaw Billings," chapter of *National Academy Of*

Sciences Biographical Memoirs, Volume VIII, (Washington, D.C.: National Academy Of Sciences, 1917), 395, 399-400; George E. Waring, Jr., *Tenth Census, 1880. Report on the Social Statistics of Cities*, (Washington, D.C.: GPO, 1886) pp. vii, 138-146, 328, 282-284; and Willcox, pp. 257-266.

⁵ The Census Office had compiled and reported births and deaths since the 1850 census but tabulated the data by state or groups of states. For Billings's appointment see Robert P. Porter, *Report of the Superintendent of the Census to the Secretary of the Interior, Organization to June 30, 1889*, (Washington, D.C.: GPO, 1889), p. 3

⁶ John Shaw Billings, M.D. *Report on the social statistics of cities in the United States at the eleventh census: 1890*, (Washington, D.C.: GPO, 1895), pp. 11-14.

⁷ Robert P. Porter, *Report of the Superintendent of the Census 1890*, (Washington, D.C.: GPO, 1890), 17f and Robert E. Chaddock, "Sanitary Districts in the Analysis of Municipal Mortality and Morbidity Data." *American Journal of Public Health*, Vol VI, NO. 6 June 1916, p. 538

⁸ John Shaw Billings, *Vital statistics of the District of Columbia and Baltimore covering a period of six years ending May 31, 1890*, (Washington, D.C.: GPO, 1893), Tables 6-12 and pp. 51-56.

⁹ Porter, 1889, 3, 8-10 and Garrison, pp. 389-396.

¹⁰ Chaddock, pp. 538-541.

¹¹ U.S. Census Bureau, *Census Tract Manual*, Fourth Edition, (Washington, D.C.: GPO, 1958), p. 1.

¹² U.S. Census Bureau, *Census Tract Manual*, Fourth Edition, (Washington, D.C.: GPO, 1958), p. 1.

¹³ Howard Whipple Green and Leon E. Truesdell, "Census tracts in American cities," (Washington, DC: Bureau of the Census, December 1934), p. 1.

¹⁴ The Tenement House Department would have preferred statistics on city blocks as they would be much more homogeneous in terms of population and the characteristics of the housing in each, but the Census Bureau's consultant balked at the cost and effort such tabulations would entail. Arthur L. Swift Jr. Dean of the New School of Social Research, "Doctor Laidlaw's Vision: The Early Years," Paper presented at the Annual Meeting of the American Statistical Association, Sept. 5, 1956, (Washington: American Statistical Association, 1956), pp. 4-5. Howard Whipple Green, *Census Tract Manual*, 1947, pp. 1.

¹⁵ "Churches Will Aid Foreign-Born Here," *New York Times*, February 2, 1914.

¹⁶ Green and Truesdell, 1934, p. 1.

¹⁷ Green saw the data as useful in determining where to site facilities and to target efforts from code enforcement to educational outreach on hygiene. Howard Whipple Green, "A Period of Great Growth and Development: 1926-1946," Paper presented at the Annual Meeting of the American Statistical Association, Sept. 5, 1956, (Washington: American Statistical Association, 1956), pp. 11-13. The Cleveland Health Council, according to

Case Western University's *Encyclopedia of Cleveland History*, was a non-profit organization that pulled together representatives from 14 of the city's hospitals. ech.cwru.edu/ech-cgi/article.pl?id=CFHACHA Accessed December 8, 2010.

¹⁸ Green, 1956, pp. 11-3. See Ernest W. Burgess, Robert Ezra Park and Roderick McKenzie, *The City*, (Chicago: University of Chicago Press, 1925).

¹⁹Green and Truesdell, 1934, pp. 1.

²⁰Howard Whipple Green, "Census tracts in American cities," Census Bureau, December 1937, pp. 3-5. Recognizing the value which small area data could yield, the American Statistical Association established the Committee of Census Enumeration Areas in 1931 to recruit people in more cities to delineate tracts. Green served as its chair and chief recruiter. He, in turn, appointed "key people" in each city who would form a committee drawing members from social service agencies, universities, and local government to set up tracts for her/his city. Green, 1956, pp. 12-15.

²¹Solomon Fabricant, *The trend of government activity in the United States since 1900*, (New York : National Bureau of Economic Research, 1952), pp. 77-83 and C. H. Wooddy, "The Growth of Governmental Functions," Ch. 25, *Recent Social Trends in the United States*, NY: McGraw-Hill, 1933 as in Solomon Fabricant, *The trend of government activity in the United States since 1900*, (New York : National Bureau of Economic Research, 1952), p. 81

²² Paul Webbink, "Unemployment in the United States, 1930-1940," *American Economic Review* Vol. 30 No. 5 (Feb 1941), pp. 259-260. By 1935, such grants stood at over 34 percent of the federal budget. Margo Anderson, *The American Census: A Social History*, (NY: Yale University Press, 1988), p. 179.

²³ Joseph P. Harris, "The Social Security Program of the United States," *The American Political Science Review*, Vol. 30, No. 3 (Jun., 1936), pp. 455-493; J. Kerwin Williams and Edward A. Williams, "New Techniques in Federal Aid," *The American Political Science Review*, Vol. 34, No. 5, (Oct. 1940) p. 954; Elias Huzar, "Federal Unemployment Relief Policies: The First Decade," *The Journal of Politics*, Vol 2, No. 3 (Aug. 1940) pp. 330- 331; and Green and Truesdell, p. 5.

²⁴ Vergil D. Reed, Asst Director of the Bureau of the Census, "What the 1940 Census Will Mean to Cities," an address delivered before the annual convention of the American Municipal Association at Chicago, IL, Nov. 1, 1939, pp. 6, 9

²⁵ Green 1956, p. 15

²⁶ Green and Truesdell, 1934, p. 5.

²⁷ Malcolm J Proudfoot, research geographer Bureau of the Census, "Intra-City Business Areas for Principal Cities." Paper presented at the Annual Convention of the American Marketing Society, November 27, 1936 republished in the *Journal of Marketing*, January 1937, Vol. 1 Issue 3, pp. 231-237, and Burgess, Park, and McKenzie, pp. 50-52. For the history of confidentiality laws and policies pertaining to census data, see Census Bureau, *A Monograph on Confidentiality and Privacy in the U.S. Census*, July 2001, pp. 14-15 available on-line at <http://www.census.gov/history> Accessed June 21, 2011.

²⁸ Reed, 1937, pp. 9-10.

²⁹ Vergil Reed, "Business Uses of Data By Census Tracts and Blocks," Paper presented before the annual meeting of the American Statistical Association, December 29, 1941, pp. 3-6.

³⁰ See Herman M. Somers, "Adequacy of Data in the Field of Public Aid," *Journal of American Statistical Association*, Vol. 36, No. 213, (Mar. 1941) for the inadequacy of administrative records and see Joseph W. Duncan and William C. Shelton *Revolution in United States Government statistics, 1926-1976*, (Washington, D.C.: GPO, 1978), pp. 39-47 for the adoption of sampling surveys.

³¹ Anderson, 1988, p. 177.

³² Duncan and Shelton, p. 47.

³³ Frankel and Stock, *Journal of the ASA*, March 1942 as in Duncan and Shelton, p. 47 and Hansen and Hurwitz, *Annals of Mathematical Statistics*, Vol. 14 (1943), pp. 333-362 as in Duncan and Shelton, pp. 54-55.

³⁴ Alfred Watson, "Use of Small Area Data in Marketing Analysis," *Journal of Marketing*, April 1942, Part 2 Vol 6 Issue 4, pp. 42-47, 47, 46. Watson had published widely in the field of marketing research and was working in the division of Commercial Research for the Curtis Publishing Company. His paper had been presented at a joint session of the American Statistical Association and the American Marketing Association.

³⁵ A. Ross Eckler and E. P. Staudt, "Marketing and Sampling Uses of Population and Housing Data," *Journal of the American Statistical Association*, Vol. 38, No. 221 (Mar. 1943), p. 91. Paper originally presented at the Annual Meeting of the American Statistical Association, Cleveland, OH, December 29-31, 1942 and Reed 1941, pp. 5-7.

³⁶ Robert W. Burgess, director of the U.S. Census Bureau, "The Relation of Census Tracts to the General Census Program," Paper presented at the 113th Annual Meeting of the American Statistical Association, December 30, 1953 and A. Ross Eckler, "Possibilities for a Quinquennial Census," Presented at a Special Meeting called by the New York Chapter of the American Statistical Association, December 3, 1952, p. 3.

³⁷ Census Tract Manual 1947, p. 7.

³⁸ Census Tract Manual 1947, p. 7.

³⁹ BoB replaced the term SMA with the term standard metropolitan statistical area (SMSA) in 1959. OMB changed the metropolitan area classification from SMSA to metropolitan statistical area (MSA) in 1983, to the general term metropolitan areas (MAs) in 1990, which encompassed primary metropolitan statistical areas (PMSAs) and consolidated metropolitan statistical areas (CMSAs). These in turn were modified to metropolitan and micropolitan statistical areas and core based statistical areas (CBSAs) in 2000. See U.S. Census Bureau, *Geographic Areas Reference Manual*, (Washington, DC: U.S. Department of Commerce, 1994), pp. 13-3 to 13-6, 13-11. And Census Bureau, *Geographic Terms and Concepts*, Appendix A of *2010 Census Redistricting Data (Public Law 94-171) Summary File*, pp. A-15 & A-16.

⁴⁰ R. Burgess, 1953, p. 5, Green, 1944, p.1, and Census Bureau, *Census Tract Manual*, Fifth Edition, (Washington, D.C.: GPO, 1966), p. 2.

⁴¹ Neighborhood Redevelopment Corporation Law of 1947 from Ch. 67 1/2, par. 253 11, (315 ILCS 20/3 11).

⁴² Urban Community Conservation Act of 1953. (315 ILCS 25/1) (from Ch. 67 1/2, par. 91.8) (Source: Laws 1953, p. 1240.)

⁴³ In addition, the district slated for demolition had a higher than citywide average percentage of dwellings which census takers had checked off as dilapidated. Pittsburgh Regional Planning Commission and the Pittsburgh City Planning Commission, "North Side Study," April 1954, pp. 7, 10, 44. And U.S. Census Bureau, *Urban and Rural Enumerator's Reference Manual: 1950 Census of the United States*, (Washington, D.C.: U.S. Department of Commerce, circa 1949).

⁴⁴ Jon C. Teaford, *Rough Road to Renaissance: Urban Revitalization in America, 1940-1985*, (Baltimore, MD: Johns Hopkins University Press, 1990), pp. 93-4.

⁴⁵ A. Ross Eckler, "A Period of Expanding Use of Tract Statistics : 1946-1956," paper presented at the Golden Anniversary Luncheon, Annual Meeting of American Statistical Association, Detroit, MI, September 8, 1956, p. 3 and US Census Bureau, "Minutes of the Census Advisory Committee on Small-Area Data," July 19-20, 1965, p. 20.

⁴⁶ Eckler, 1956, pp. 3, 19.

⁴⁷ Conrad Taeuber, assistant director of the Census Bureau, "Comments for Workshop on the 1960 Census," Statement for workshop on the 1960 Census of the American Society of Planning Officials, San Francisco, CA, March 18, 1957, p. 4. And Morris Hansen, assistant director of the Census Bureau, "The Impact of the 1960 Census," a talk presented at the Seventh Annual Public Utilities Seminar of the American Marketing Association, Houston Texas, March 2, 1961, p. 9f.

⁴⁸ Turner and Bohme, p. 17.

⁴⁹ Statement of Richard L. Nelson, President Real Estate Research Corporation, to the U.S. House of Representatives, Subcommittee on Census and Statistics of the Committee on Post Office and Civil Service, *Hearings on Mid-Decade Census*, Part 1, Chicago, IL, October 25, 1961, 87th Cong., 2nd Sess., 1962, pp. 52-61, 53, 55.

⁵⁰ Statement of Jack R. Cole, President Mail Advertising Corp of America, to the U.S. House of Representatives, Subcommittee on Census and Statistics of the Committee on Post Office and Civil Service, *Hearings on Mid-Decade Census, Part 1*, Chicago, IL, October 25, 1961, 87th Cong., 2nd Sess., 1962, pp. 130-138.

⁵¹ Hansen, 1961, p. 9f.

⁵² Conrad Taeuber, assistant director of the Census Bureau, "Comments for Workshop on the 1960 Census," Statement for workshop on the 1960 Census of the American Society of Planning Officials, San Francisco, CA, March 18, 1957, p. 4.

⁵³ Morris Hansen, "Outlook for Census Information by Zip-Code Areas," Presented at the Meeting of the Direct Mail Advertising Association, Inc., Washington DC, March 8, 1967, Revised Version, July 12, 1967, pp. 1-5.

⁵⁴ A. Ross Eckler, "Emerging Federal Developments Related to State and Local Data Needs," Presented at the National Conference on Comparative Statistics, Sponsored by the National Governor's Conference in cooperation with the Council of State Governments, Washington, DC, February 25, 1966, pp. 2-3.

⁵⁵ Statement of Dr. Raymond T. Bowman, Assistant Director for Statistical Standards, Bureau of the Budget, to the U.S. House of Representatives, Subcommittee on Census and Statistics of the Committee on Post Office and Civil Service, *Hearings on Mid-Decade Census, Part 1*, Washington, D.C., May 4, 1965, 89th Cong., 1st Sess., 1965, p. 54. See also the written statement by Sargent Shriver, Director, Office of Economic Opportunity to the Honorable Harley O. Staggers, Chairman, U.S. House of Representatives, Subcommittee on Census and Statistics of the Committee on Post Office and Civil Service, April 30, 1965 in the *Hearings on Mid-Decade Census*, May 4, 1965, p. 11.

⁵⁶ Samuel P. Korper, Deshaies, John C., Schuerman, Leo A., Crellin, Ronald E. "Composite Social Indicators for Small Areas -- Census Use Study -- Recent Developments in Methodology and Uses," Paper presented at the Conference on Small Area Statistics of the American Statistical Association, Montreal Canada, August 1972, p. 2.

⁵⁷ Korper, et al, 7-9; And Samuel P. Korper, "Census Use Study Health Information Study Interaction with New Haven Data Users in the Health Area," Presented at the Seminar at the Health Services Mental Health Administration (DHEW), Rockville, MD, March 22, 1971, pp. 6-9; U.S. Census Bureau, *1970 Census of Population and Housing: Procedural History*. (Washington, D.C.: GPO, 1976), 1/7-8, 13/2-5; and Turner and Bohme, p. 18.

⁵⁸ Margo Anderson and Stephen E. Fienberg, "To Sample or Not to Sample? The 2000 Census Controversy," *Journal of Interdisciplinary History* 30.1 (1999), pp. 14-15.

⁵⁹ Marshall L. Turner, Jr. and Robert A. LaMacchia, "The U.S. Census, Redistricting, and Technology," *Social Science Computer Review*, Vol.17, no. 1, Spring 1999, pp. 17, 20.

⁶⁰ Testimony of Mr. Marshall L. Turner, Jr., Assistant Chief Decennial Census Division, U.S. Census Bureau before the U.S. House of representatives Subcommittee on Census and Population. Field Hearing, Part X, Houston, TX, May 4, 1979.

⁶¹ Turner and LaMacchia, p. 23.

⁶² J. Gregory Robinson, et al, "Illustrative Assessment of the Impact of Census Underenumeration and Income Underreporting on Revenue Sharing Allocations at the Local Level," Paper presented at the American Statistical Association Meeting, August 1979.

⁶³ See GAO/HRD-87-28 for the eligibilty criteria for UDAG "pockets of poverty." U.S. General Accounting Office, "Grant Formulas: A Catalog of Federal Aid to States and Localities," GAO/HRD-87-28, Washington, D.C. March 23, 1987, pp. 150-153. And Internal Revenue Code of 1986 (26 U.S.C. 42(d)(5)(C)).