From the Town Square to the Internet

A Historical Analysis of Census Data User Services From 1790 to Present

Issued September 2011

CLMS/11-11594

United States™ Census Bureau

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU

ACKNOWLEDGMENTS

The project team thanks the following organizations and individuals for participating and assisting with this project:

The principal federal statistical agencies: Bureau of Economic Analysis; Bureau of Justice Statistics; Bureau of Labor Statistics; Department of Agriculture, Economic Research Service; Energy Information Agency; Internal Revenue Service, Statistics of Income; National Agriculture Statistics Services; National Center for Health Statistics; and National Science Foundation, National Center for Science and Engineering Statistics.

Census Bureau divisions and offices: Administrative and Customer Services Division (History staff, Library staff, and Statistical Compendia staff); Advisory Committee Office; American Community Survey Office; Center for New Media and Promotions; Congressional Affairs Office; Center for Economic Studies (Research Data Centers and Local Employment Dynamics Program); Customer Liaison and Marketing Services Office, Company Statistics Division; Data Access and Dissemination Systems Office; Demographic Surveys Division; Economic Planning and Coordination Division; Field Division, including the regional offices in Atlanta, Boston, Charlotte, Chicago, Dallas, Denver, Detroit, Kansas City, Los Angeles, New York, Philadelphia, and Seattle; Foreign Trade Division; Geography Division; Governments Division; Housing and Household Economics Division; National Processing Center (Age Search, Commercial Map Sales, and Reimbursable Work); Office of Economic Planning and Innovation; Public Information Office; Population Division; and Services Sector Division.

Census Information Center Program Steering Committee participants: Asian American Federation of New York, Asian Pacific American Census Information Center of the University of Maryland, Chinese American Voters Education Committee, Joint Center for Political and Economic Studies, Metropolitan Center of Florida International University, NAACP, National Institute for Latino Policy, Norfolk State University Center for Applied Research and Public Policy, and Papa Ola Lokahi.

State Data Center Program Steering Committee participants: Florida State Data Center, New York State Data Center, Wyoming State Data Center, Georgia State Data Center, North Carolina State Data Center, Pennsylvania State Data Center, California State Data Center, Mississippi State Data Center, and the Vermont State Data Center.

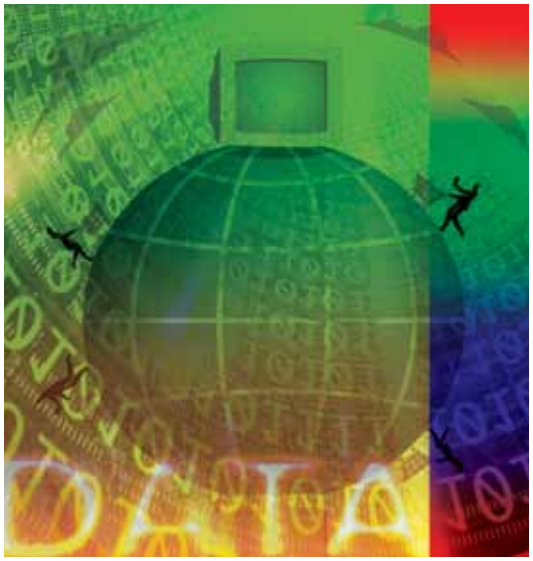
Paul Scanlon, American Community Survey Office, for serving as the advisor for the project; **Chandra Erdman**, Center for Statistical Research and Methodology, for preparing the figures in the report; **Eric Newburger** and **Monica Wroblewski**, Communications Directorate, for their assistance in developing the survey questions; **Linda Chen** and **Christine E. Geter**, Administrative and Customer Services Division, for providing graphics services and editorial assistance, respectively.

This report was prepared by **Barbara Harris**, Communications Directorate, and **William (Troy) King** and **Russell Davis, Jr.**, Customer Liaison and Marketing Services Office.

From the Town Square to the Internet

A Historical Analysis of Census Data User Services From 1790 to Present

Issued September 2011



U.S. Department of Commerce
Rebecca M. Blank,
Acting Secretary

Vacant,
Deputy Secretary

Economics and Statistics Administration
Rebecca M. Blank,
Under Secretary for Economic Affairs

U.S. CENSUS BUREAU
Robert M. Groves,
Director

Suggested Citation

U.S. Census Bureau,
From the Town Square to the Internet: A Historical Analysis of Census Data User Services From 1790 to Present
U.S. Government Printing Office,
Washington, DC, 2011.

Economics and Statistics Administration

Rebecca M. Blank,
Under Secretary for Economic Affairs

U.S. CENSUS BUREAU

Robert M. Groves,
Director

Thomas L. Mesenbourg,
Deputy Director and Chief Operating Officer

Steven J. Jost,
Associate Director for Communications

Burton H. Reist,
Assistant Director for Communications

Tasha R. Boone,
Assistant to the Associate Director for Communications

Contents

ABSTRACT

As the U.S. Census Bureau moves closer and closer to Internet-only dissemination of data, it should be mindful that there are still gaps in Internet access by certain demographic groups and ensure its data dissemination and access services are sufficient to meet the needs of all of its data users. This report provides important baseline information on who the Census Bureau's typical data users are, how they have changed over time, and ways to improve access for communities and populations with limited knowledge of Census Bureau data who do not have full access to the Internet. These issues were explored with Census Bureau divisions and offices. Other principal federal statistical agencies were asked how they have addressed these same issues within their organization. The data intermediaries in the State Data Center (SDC) and Census Information Center (CIC) programs were asked to identify barriers in accessing census data and to suggest ways to improve data access services to communities without full access to the Internet.

The findings show that the Census Bureau's major data user groups have not changed in decades, but the number of data users have expanded and there are more casual/nontraditional data users who require more time and resources to address their needs. The findings also show that the Census Regional Offices, SDCs, and CICs are on the frontline in providing data access services to communities and populations without Internet access. In terms of data dissemination, the agency has experienced a gigantic change over time that has taken it from referring to summary files and massive volumes of paper to accessing and disseminating data in seconds.

INTRODUCTION

For the first 150 years of census history, all data results and reports were published on paper (books with tables and ledgers). With the advent of the UNIVAC 1 computer in 1951, the Census Bureau has been quick to take advantage of technological changes in data dissemination, using tools such as computers, magnetic tapes, CENDATA, Topologically Integrated Geographic Encoding and Referencing (TIGER) System, CD-ROMs, DVDs, and the Internet—as well as innovations in data collection, such as statistical sampling and the American Community Survey. These changes in technology and data collection have resulted in a broader group of census data users. This report provides important baseline information on the census data users, how it disseminates data to them, and a historical perspective on the related changes over time. It also identifies ways to improve our data dissemination and provide services to those who do not have full access to the Internet.

The report is organized as follows:

The "Methods" section includes information on how survey respondents were selected, how the data was collected, and how the data was analyzed.

Chapter 1, "A Foundation for the Future," provides a chronological history of data user services at the Census Bureau from 1790 to present. It is presented in short vignettes of history to describe the content and scope of data collected by the Census Bureau over time, how the agency disseminated and provided access to its data over time, and who the data users were over time. The information is taken from various historical documents and the Census History staff Web site.

Chapter 2, "The Challenge Continues: The Future of Data User Services," is a summary of the findings and analysis of the responses to the three surveys that were conducted for this research project. This chapter is divided into six subparts: (1) "Census Data Users"—describes the current census data users, who they are and how they have changed over time; (2) "The Typical Census Data Users"—presents information from five independent sources in an effort to identify the major categories representing census data users; (3) "Data Access and Dissemination Methods"—discusses current census data access and dissemination methods and how they have changed over time; (4) "Communities With Limited Internet Access to Census Data"—identifies communities and populations who have limited knowledge of Census Bureau data and limited access to census data through the Internet; (5) "Barriers to Data Access"—addresses the barriers these populations have to accessing census data; and (6) "Ways and Means of Improving Data Access"—provides information on the ways and means to improve access to data users who do not have full access through the Internet and to those with limited knowledge of Census Bureau data.

Chapter 3, "Conclusions, Challenges, and Recommendations," provides concluding remarks that address the three main purposes of this research project, which were to analyze data user services over time, define the Census Bureau's "typical" data users, and provide recommendations to address challenges in disseminating census data via the Internet.

The appendixes include a list of resources that were used to conduct research for this project and the survey questionnaires.

The report findings will show that there are differences in the responses for Census Bureau headquarters divisions and offices and the Census Regional Offices (ROs). This is because headquarters offices are responsible for developing overall program plans and guidelines, while the ROs are tasked with implementing the program plans and operations since they are closer to the census data users.

There were also differences in the responses between the Census Bureau and the other principal federal statistical agencies as well. The responses from the Census Bureau's divisions and offices were more consistent than the responses from the other principal federal statistical agencies. This is due to the fact that other federal agencies have different missions and tend to conduct more analytical research and reports, while the Census Bureau is more known for producing raw data that is used by the other statistical agencies. Additionally, the data users of the other federal statistical agencies tend to be more specialized, such as the Supreme Court, the National Pork Producers Council, lawyers, farmers, agribusinesses, food processors, and science and technology human capital developers.

Please note, the percentages stated throughout the report and in the figures may add to more than 100 percent because respondents could provide multiple responses to a given question.

METHODS

Sample Design and Selection

This study was designed with three purposes in mind: (1) Prepare an in-depth historical analysis of the Census Bureau's data user services; (2) Define the Census Bureau's "typical" data users; and (3) Identify ways to improve data user services to communities of color, rural communities, and those without full access to the Internet. For this study, the managers of 40 divisions, offices, and program areas within the Census Bureau (including the 12 Census Regional Offices [ROs]); 22 participants from the Census Information Center (CIC) and the State Data Center (SDC) programs,[1] and the 14 principal federal statistical agencies[2] (including the Census Bureau), were contacted to participate in this project. The Census Bureau divisions and offices were selected because their programs impacted data users. There are 94 federal agencies that have statistical programs. The 14 principal federal statistical agencies were chosen because it was a more manageable group, representing the federal agencies with the most significant statistical programs. The Council of Professional Associations on Federal Statistics helped to identify the appropriate contacts at each of the agencies. Contact information was also obtained from Census Bureau staff, the Internet, or from "cold calls" made to obtain the name(s) of individuals that would be able to provide assistance. Meetings were held with the department head or their designees from each of the divisions and offices to explain the project and answer questions. After the initial meeting, divisions and offices were e-mailed a copy of the questionnaire and asked to return it by January 31, 2011. The Census Bureau's Field Division coordinated the discussions and participation of the ROs. The initial discussions with the CICs, SDCs, and principal federal statistical agencies were conducted through telephone calls and e-mails.

Data Collection

The data collection phase was conducted from December 16, 2010, to March 16, 2011. The deadline was extended several times to obtain a higher response rate. The original deadline was January 31, 2011. The survey instruments were developed in collaboration with the research staff from the Census Bureau's Communications Directorate. There were two survey instruments: (1) a nine-question questionnaire was e-mailed to Census Bureau divisions and offices and to the other principal federal statistical agencies; and (2) the link to a five-question questionnaire using Survey Pro, a Web-based application, was e-mailed to the CICs and SDCs. The two survey instruments are included in Appendix B of this document.

Of the 40 Census Bureau divisions, offices, and program areas, and the 14 federal statistical agencies, 93 percent and 71 percent responded, respectively. Eighty-six percent of the 22 CICs and SDCs responded.

Data Analysis

Content analysis—also known as thematic analysis—was selected as the research tool for this study because it gives the ability to convert qualitative responses into quantitative data for analysis. Used extensively in anthropological research, this method provides the opportunity to both quantitatively and qualitatively analyze the presence of certain words or concepts within the text or sets of text. While text can be defined broadly, in this study, a text refers to individual responses to the questionnaire—thus, the text is the data.[3] Content analysis can be thought of as establishing the existence and frequency of concepts most often represented by words or phrases in a text.

Bernard (2006)[4] presents a number of methodological issues that researchers must keep in mind when using content analysis as a primary analysis method, two of which are important in this study. The first is that respondents may interpret the question in an interview or survey differently. Basically, a word or phrase may be understood to mean different things to different people or groups. In this case, as respondents were asked to fill out a survey without the

[1] The CIC and SDC programs are formal partnerships with the Census Bureau where participants serve as data intermediaries to disseminate census data to state and local governments and communities throughout the United States.

[2] There are 15 principal federal statistical agencies, including the Census Bureau. Only 14 were contacted to participate in this project. The Office of Management and Budget was excluded.

[3] In conceptual analysis, a concept is chosen for examination, and the analysis involves quantifying and tallying its presence. While explicit terms are easy to identify, coding for implicit terms and deciding their level of implication is complicated by the need to base judgments on a somewhat subjective system.

[4] Bernard, Russell H., "Research Methods in Anthropology," Fourth Edition, Altamira Press, pp. 260 and 511, 2006.

researcher being present, it is possible that terms as basic as "data user" were understood differently across offices and agencies. The second issue relates to who codes the text. Coding is the reductive process by which the full text is broken down into its thematic component parts. The key to coding is to construct the codes as detailed as possible. Using what was written by the respondents, the text was coded into manageable categories or variables on a number of levels, words, phrases, or themes. These codes were then quantified and their frequencies analyzed.

Literature Review

There was no literature review conducted for this project. However, the Census Bureau recently commissioned Abt Associates to conduct an expert review of its Web site properties. This Web discovery investigation was composed of 17 different interviews with 22 Census Bureau staff members across 7 directorates, an expert review of the Census Bureau online presence and 11 other government/statistical Web sites, and a review of Census documents and external best practice literature. The interviews and Web discovery process were conducted to address the gap between the Census Bureau's current data dissemination practices and emerging best practices. The report entitled "Emerging Trends and Best Practice: The Census Bureau and Web 2.0" was reviewed as part of this project and the applicable findings and recommendations are included in Chapters 2 and 3 of this report.

CHAPTER 1.
A FOUNDATION FOR THE FUTURE

Since the first enumeration of the United States in 1790, the subject content and scope of the census has changed to reflect the data needs of the national government and other data users. Innovation in technology and data collection played a significant role in how the Census Bureau disseminated data and who its data users were. Technological advances such as computers, CD-ROMs, and the Internet have expanded the number of census data users. Innovations in data collection, such as the tabulation of small area data, statistical sampling, the economic censuses, and the American Community Survey (ACS) have broadened the types of data users over time. Below is a chronological history of the Census Bureau's data user services and its data users from 1790 to the present. It is presented in small vignettes of history focusing on the content and scope of data collected by the Census Bureau and the methods of disseminating the information to data users.

For the first 150 years of census history, the Census Office concentrated almost exclusively on its constitutionally mandated task of making a count of the population for the purposes of apportioning representation and taxation. The first intended uses of the census were to enable the federal government to levy taxes (to pay debts from the Revolutionary War) and apportion representatives in the national legislature among the states in proportion to their populations.

1790–1899

Throughout its early history, census officials struggled to quickly collect and accurately process and tabulate census information since the first enumeration. The 1790 Census was conducted in the original 13 states and four other districts and territories. Each household was asked to give the name of the head of the family and the number of persons in the household, free and slave. There were data on such characteristics as sex, age (for free White males only), and race (by implication).[1] The 1790 Census results were generally published by county and place, and in some areas by county subdivisions. Completed census schedules were posted in the two most public places in each jurisdiction. The report of the first census is still in existence today. It is contained in an octavo volume of 56 pages. This little book, discolored and crumbling with age, is very rare indeed with the existence of only a few copies being known, two of which are in the Census Bureau Library and another is in the Library of Congress.[2]

The censuses of 1800–1840 were conducted in a similar manner as the 1790 Census, although more territories were added and more economic data were collected on manufacturing concerning the quantity and value of products. The 1820 Census collected similar data on agriculture, commerce, and manufacturing. The economic data were still erratically collected. The 1830 Census only counted the population, leaving out the manufacturing and industry data after the failures of the past two censuses in properly counting economic data. In the 1840 Census, data were collected on the pursuits, industry, education, and resources of the country. There were new questions about school attendance, literacy, the deaf and dumb, the blind, the insane and idiotic, and vocation, as well as on manufactures, agriculture, mining, and fisheries. There was no tabulation of this new data beyond the simple addition of the entries the U.S. Marshals submitted, and there was no attempt to publish details uniformly by cities and towns, or to summarize returns for each state, other than by county.[3] The 1800–1840 Censuses were disseminated in printed reports.

Beginning with the 1850 Census, all free persons were listed by their name with their characteristics, which then included occupation, place of birth (state or country), and school enrollment. The U.S. Marshals also collected additional social statistics, including information on taxation, schools, crime, wages, value of the estate, mortality, churches, and pauperism. Prior to 1850, the population censuses listed the names of the household heads only and tallied the number of people in each family according to their age, sex, race, and later employment. Economic data were also collected on mining, agriculture, fishing commerce, and manufacturing. The 1860 Census was conducted very similarly to the 1850 Census. The 1850 and 1860 Censuses were published on paper in the form of books with tables and ledgers consisting of 2,165 pages and 3,189 pages respectively.

By the mid-1800s, the census questions reflected the nation's need for information beyond mere population statistics to manage

[1] "FactFinder for the Nation," History and Organization, p. 1, May 2000.

[2] Department of Commerce, Bureau of the Census, "The Story of the Census: 1790–1916," pp. 6–7.

[3] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 3.

growing industry and expanding domestic and foreign trade. At the end of the Civil War, the government had to take stock of itself as reconstruction (with a new status for African Americans) and recovery went forward and westward settlement resumed. As always, the decennial census was an instrument for collecting data to guide these assessments, plan legislation, and measure progress. The 1870, 1880, and 1890 Censuses featured increasingly greater detail in a whole spectrum of report forms—population, mortality, governments, agriculture, manufacturing, mining, transportation, and so forth.[1] After the census of 1870, maps and charts were introduced to portray census results in a statistical atlas. In 1878, the Statistical Abstract, perennially the federal government's best-selling reference book, was first printed.[2]

For the 1880 Census, data were collected on the condition and operation of railroad corporations; incorporated express companies; telegraph companies; life, fire, and marine insurance companies; the inhabitants, industries, and resources of Alaska; and untaxed Indians. The general scope of the 1880 Census was expanded only slightly over that of the 1870 Census. Much greater detail was obtained for many of the items, so much more that, beyond the basic counts, which were released promptly, publication of these data was not completed until nearly 1890.[3] The economic statistics compiled in the 1880 Census were more comprehensive than those of any previous census. The number of general economic questions was expanded to 29, and 49 special schedules were designed. These schedules contained almost 3,000 inquires, including over 1,600 unique items. The 1880 economic censuses marked the first major effort to compile detailed statistics on transportation and communications.[4]

In 1890, there was an extension of the decennial census' scope, and more subjects were covered in even greater detail than in 1880. Data were collected in supplemental surveys on farm and home mortgages; private corporations' and individuals' indebtedness; surviving Union soldiers and sailors, and the widows of those who had died; and race, including Japanese, Chinese, Negro, mulatto, quadroon, octoroon, and White.[5] This was the first census to use Herman Hollerith's electric tabulating system. Even with the Hollerith machine, there were so many more inquiries in the censuses of 1880 and 1890 that almost a full decade was needed to publish all of the results.[6] This meant that although the census was furnishing large quantities of statistics, it was failing to provide data when it was most needed. This led Congress to limit the 1900 Census questions. Many of the dropped topics reappeared in later censuses as advances in technology made it possible to process and publish the data more quickly.

The censuses of manufactures and mineral industries, conducted in 1890, saw the first use of administrative records to compile the economic census data. The census expanded the number of questions on transportation, with coverage extending to sailing vessels and rapid-transit facilities in cities, which later included cable railways, railways operated by animal power, and electric street railroads.[7]

1900–1939

The 1900 Census dealt with questions on population, mortality, agriculture, and manufacturing. Also collected after the completion of the regular census were data regarding incidents of deafness, blindness, insanity, juvenile delinquency and the like, religious bodies, utilities, mining, and transportation. Hawaii was included in the census for the first time.

Some of the early data users were the U.S. Congress, federal and local government leaders, and scholars such as professional statisticians. The government officials had pragmatic needs for population figures in deciding where to put such things as roads, postal stops, and military barracks. Data from the censuses of 1790–1900 were published on paper in the form of books with tables and ledgers.

In 1902, the former temporary Census Office was made a permanent office within the Department of the Interior. In 1903, it became the Bureau of the Census and was moved to the new Department of Commerce and Labor.[8]

When the United States entered World War I in 1917, the Census Bureau took on an important new role. During the nation's mobilization for the war, the United States

[1] Turner Jr., M. L., and F. G. Bohme,"The National Census: The Parts Are Greater Than the Whole," p. 2, November 5–8, 1992.

[2] U.S. Census Bureau, History Web site, Publications, Subjects A–Z, <www.census.gov/history/www/reference/publications/statistical_abstracts.html>.

[3] Gauthier, J. G., U.S. Census Bureau, "Measuring America: The Decennial Censuses From 1790–2000," pp. 125–26, September 2003.

[4] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 5.

[5] Gauthier, J. G., U.S. Census Bureau, "Measuring America: The Decennial Censuses From 1790–2000," p. 126, September 2003.

[6] Gauthier, J. G., U.S. Census Bureau, "Measuring America: The Decennial Censuses From 1790–2000," p.126, September 2003.

[7] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 6.

[8] Gauthier, J. G., U.S. Census Bureau, "Measuring America: The Decennial Censuses From 1790 to 2000," pp. 126–127, September 2003.

was able to use its compiled population and economic data to report on populations of draft-age men, along with the industrial capacities of each state.[1] Since 1915, the Census Bureau has conducted an increasing number of special enumerations for local governments, at their expense, to measure demographic changes that affect the allocation of money from federal and state agencies—especially where there is considerable population growth between censuses.[2] There were a number of special economic censuses in 1917 and 1918—something not done previously—because of the urgent needs for industrial data during World War I.[3]

Data was collected on a limited basis for census tracts starting with the 1910 Census. This collection of small area data continued to expand as more programs—such as those of the New Deal, in response to the Great Depression of the 1930s—required more small area data. Depression era statisticians also used small area data as a sample frame for the newly adopted tool of sample surveys, which was widely used in the 1940s. With the advent of sample surveys, the 1940 Census was the first to have short- and long-form questionnaires for the decennial census, with the long-form questions asked on a sample basis.

During the period from 1910 to 1945, census data users included the federal government (including Congress), health organizations, scholars, local businesses, churches, state and local governments, and social welfare charity groups requesting census numbers on a lower level than the nation, especially small area data when available. Vital statistics inquiries were removed from the questionnaire, with questions added about mines, quarries, and nationality or mother tongue of foreign-born persons and their parents. The introduction of census tracts began the process of distinguishing different patterns of demographic and socioeconomic characteristics, including housing, of just a few thousand neighbors within an overall densely settled urban area. Previously, the census reported figures only for governmental units such as cities and places, and in rare instances for wards.[4]

After the 1920 Census was conducted, a census of manufactures was taken in 1921; previously, it had been conducted every 5 years. Also, a census of agriculture and livestock was done in 1925 and was to be repeated every 10 years thereafter. These censuses, which had once been closely aligned with the decennial population count, were by 1920 largely independent of each other. Similar to the 1910 Census, the 1920 Census did not ask about unemployment on the day of the census, the number of children born, or how long a couple had been married. There were new questions on the year of naturalization and mother tongue. There was no separate schedule for Indians. The results of the 1920 Census revealed a major and continuing shift of the population of the United States from rural to urban areas. No apportionment was carried out following the 1920 Census because representatives elected from rural districts tried to come up with mechanisms that would blunt the impact of the population shift. Instead, reapportionment occurred again after the 1930 Census.[5]

The 1930 Census was a census of population, agriculture, irrigation, drainage, distribution, unemployment, and mines. The census encompassed each of the 50 states, the District of Columbia, Alaska, Hawaii, and Puerto Rico. Before Census Day on April 1, the stock market crashed, and the nation plunged into the Great Depression. The public and academics wanted quick access to the unemployment information collected in the 1930 Census. As a result, when the Census Bureau rushed its release of the data on unemployment, the numbers were attacked as being too low. Consequently, Congress required a special unemployment census for January 1931. The data it produced confirmed the severity of the situation. Congress mandated that another unemployment census be conducted in 1937, where a two percent statistical sample of census questionnaire recipients were delivered a special census questionnaire to test the accuracy of the larger census—an early use of statistical sampling.[6]

The economic component of the 1930 Census was broader in scope than any previous census, encompassing censuses of manufactures and mineral industries, construction industries, distribution (which included retail, wholesale trade, and special topics), and hotels.[7] These censuses covered activities for the year 1929. There were economic censuses in 1931, 1933,

[1] U.S. Census Bureau, History Web site, 1910 Overview, <www.census.gov/history/www/through_the_decades/overview/1910.html>.

[2] U.S. Census Bureau, "FactFinder for the Nation: History and Organization," p. 4, May 2000.

[3] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 7.

[4] Turner, Jr., Marshall L. and Frederick G. Bohme, "The National Census: The Parts Are Greater Than the Whole," p. 11, November 5–8, 1992.

[5] U.S. Census Bureau, History Web site, 1920 Overview, <www.census.gov/history/www/through_the_decades/overview/1920.html>.

[6] U.S. Census Bureau, History Web site, 1930 Overview, <www.census.gov/history/www/through_the_decades/overview/1930.html>.

[7] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 9.

1935, and 1937. The 1937 economic census included a census of manufactures.

The Census Bureau implemented statistical sampling in a decennial census for the first time in 1940. Sampling made it possible to add additional detailed questions of the population without unduly increasing cost or respondent burden. Enumerators asked a random sample of the population (every fifth person) a set of extra questions. The Census Bureau then used the sample to extrapolate demographic data for the United States. Furthermore, the Census Bureau could now collect more data on smaller geographical areas and make inferences to the larger population. [1]

1940–1959

The 1940 Census combined a population census with a housing census in each of the 50 states, the District of Columbia, Hawaii, Puerto Rico, the Virgin Islands, and Alaska. The housing census was to provide information concerning the number, characteristics (including utilities and equipment), and geographic distribution of dwelling structures and dwelling units in the United States. The population and housing censuses were treated as two separate censuses, although the enumerators collected the information at the same time from each housing unit.[2] One of the major innovations of the 1940 Census was the use of advanced statistical techniques, including probability sampling, which had been previously used only on an experimental basis. In addition, sampling allowed the Census Bureau to increase the number of published detailed tables and to review the quality of the data processing with more efficiency. Several questions reflected the concerns of the depression years. Along with the new census focusing on the condition of the nation's housing stock and the need for public housing programs, the 1940 Census included questions about employment, internal migration, and income.[3] Another important milestone in the trend toward providing small-area data was the introduction of tabulations for "census blocks," the smaller pieces that comprised census tracts in the 1940 census of population and housing.[4]

The 1940 decennial census included the censuses of business (retail and wholesale trades, selected service establishments, places of amusement, hotels, tourist camps, and construction), manufactures, and mineral industries, and collected data for the year 1939. During World War II, the government discontinued the periodic economic censuses in favor of war-related surveys that provided statistics for the Office of Price Administration, the War Manpower Commission, the Office of Defense Transportation, and other agencies in charge of defense efforts. The first economic census taken after World War II was the 1947 census of manufactures, with the classification of industries based on the 1945 Standard Industrial Classification (SIC) Manual. Prior to World War II, the Census Bureau had developed its own classifications. In 1948, the Census Bureau was authorized to conduct economic censuses for 1948 and every fifth year thereafter. As a result, there was a 1948 business census which included retail trade, wholesale trade, and selected service industries.[5]

Sampling techniques developed for the censuses led to the use of demographic surveys in the 1940s. The resultant statistics would be representative of the nation as a whole, or in some cases of regions, states, or smaller areas, depending on the size of the sample. The Monthly Report on the Labor Force in 1943 was expanded and renamed the Current Population Survey in 1947.[6] Some economic surveys started early in the twentieth century, such as the Cotton Survey in 1902, the Current Industrial Reports (called Facts for Industry prior to 1960) in 1906, and the Survey of Current Business in the 1920s. County Business Patterns began in 1946. The Annual Survey of Manufactures was first conducted in 1949 to provide data for in-between census years. A national housing survey was first taken in 1956. Construction surveys began in 1959. Currently, the Census Bureau conducts more than 200 economic and demographic sample surveys each year, and uses the results to produce national figures. It also does reimbursable work for other federal agencies—surveys on a wide range of topics.

During the period from 1946 to 1964, census data users included local, state, and federal governments, city planners, academicians, businesses, and professional associations. In the mid-1950s, state highway departments were using

[1] U.S. Census Bureau, History Web site, "Developing Sampling Techniques," <www.census.gov/history/www/innovations/data_collection/developing_sampling_techniques.html>.

[2] Gauthier, J. G., U.S. Census Bureau, "Measuring America: The Decennial Censuses From 1790 to 2000," p. 135, September 2003.

[3] U.S. Census Bureau, History Web site, 1940 Overview, <www.census.gov/history/www/through_the_decades/overview>.

[4] Turner, Jr., Marshall L. and Frederick G. Bohme, "The National Census: The Parts Are Greater Than the Whole," pp. 2–3, November 5–8, 1992.

[5] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 11–13.

[6] U.S. Census Bureau, History Web site, "Innovations-Data Collection-Developing Sampling Techniques," <www.census.gov/history/www/innovations/data_collection/developing_sampling_techniques.html>.

census data to conduct surveys, and the Federal Highway Act of 1962 required the use of census information. Also, consulting firms and large corporations such as Real Estate Research Corporations and Ford Motor Company used census population statistics in market research. City planners and local governments used data collected by the Census Bureau in redevelopment programs, one of which is the Housing Act of 1949.

During the period of 1950–1959, the Census Bureau entered the computer age by using the first commercial electronic computer, the UNIVAC 1, to compile a portion of the statistics from the 1950 Census and to process the entire economic census in 1952. Throughout the 1950s, UNIVAC 1 was used to process several monthly economic surveys. UNIVAC 1 enabled the Census Bureau to disseminate data on magnetic tape, although this was not the plan when the Census Bureau acquired UNIVAC 1. It was more of a by-product or an after-thought.

The 1950 Census encompassed the continental United States, the territories of Alaska and Hawaii, American Samoa, the Canal Zone, Guam, Puerto Rico, the Virgin Islands of the United States, and some of the smaller island territories. Americans abroad were enumerated for the first time in 1950. A new survey on residential financing was conducted as part of the 1950 Census. Information was also collected on a sample basis from owners of owner-occupied and rental properties and mortgage lenders.[1]

Congress enacted Public Law 83-467 in June of 1954, providing for censuses of manufacturing, mineral industries, and other business (including the distributive trades and service establishments) in the year 1955 relating to the year 1954, instead of a census in 1954 relating to the year 1953. The economic censuses became an integrated economic statistical program in which data for retail trade, wholesale trade, manufacturing establishments, and construction, mineral, and service industries were collected for the same benchmark years.[2]

1960–1989

It was during the period of 1960–1969 when the American Statistical Association (ASA), the first Advisory Committee to the Census Bureau, recommended that the Census Bureau examine actual user applications of census data to learn how census data might be designed for easier access and use. As a result of the recommendations of the ASA, the Census Bureau established the Census Use Study Office to conduct joint projects with data users and the Data Access and Use Laboratory to develop guides, catalogs, and training materials to assist data users in locating and accessing census data.[3] While the U.S. Constitution, the U.S. Congress, and professional statisticians were early forces in providing direction for the content and uses of census data, the Census Bureau did not begin to build a user support program as such until the early 1960s.

The 1960s saw an explosion in electronic data-processing capabilities in business, industry, academia, and government, who now had the capability to manipulate and process large numbers of statistics. Thus, in the 1960s, the Census Bureau finally could provide a wide variety of published and unpublished tabulations, and indeed did experience a somewhat unexpected 25 percent increase in requests for special tabulations, summary tapes, and the like.[4] At this time, the census data users included the Congress and the rest of the federal government, state and local governments, courts, businesses, professional associations, and individuals. There was an increase in federal demand for data to document emerging programs, such as civil rights and revenue sharing.

The proliferation of large-scale digital computers throughout society resulted in the governments of states and cities, major universities, and large business firms to ask the Census Bureau to duplicate and sell copies of the hundreds of computer tally magnetic tapes so that they could more rapidly and accurately use these data. The Census Bureau had not foreseen the demand from "outside" users for copies of the UNIVAC census tapes when it had designed the 1960 Census products in the late 1950s. As a result of data user interest, the Census Bureau produced its first magnetic tapes, containing results from the 1960 Census, to meet data user needs. These "test tapes" were produced well after the data became available in print, which up to that point had been the only medium for conveying census data to users.[5] New questions on place

[1] Gauthier, J. G., U.S. Census Bureau, "Measuring America: The Decennial Censuses From 1790–2000," p. 126, September 2003.

[2] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 14.

[3] Turner, Jr., Marshall L., "Developing A User Support Program: 1965–1990 in the United States," paper prepared for the Cairo Conference on Dissemination and Use of Census Data, p. 2, Cairo, Egypt, October 9–13, 1988.

[4] Turner, Jr., Marshall L. and Frederick G. Bohme, "The National Census: The Parts Are Greater Than the Whole," p. 15, November 5–8, 1992.

[5] Turner, Jr., Marshall L., "Developing A User Support Program: 1965–1990 in the United States," p. 2, Cairo, Egypt, October 9–13, 1988.

of work and means of transportation to work were added in 1960.[1]

The 1963 economic census was the first to feature a census of transportation. Four surveys, each aimed at a specific gap in knowledge regarding transportation, were conducted. Collection of data from commercial fisheries was resumed after a 55-year hiatus. The 1963 economic censuses of retail and wholesale trades, selected service industries, manufactures, and mineral industries closely resembled those conducted in 1958. In 1967, Congress modified Title 13, changing the reference years for the economic censuses to those ending in "2" and "7." The 1967 economic censuses included retail and wholesale trades, selected services, construction and mineral industries, manufactures, commercial fisheries, transportation, and enterprise statistics programs. The scope of the 1967 economic censuses was expanded in various ways, with the census of construction beginning on a regular basis.[2]

After the ASA recommended examining actual user applications of census data in 1964, the Census Bureau began in earnest to develop a data user services program.[3] The idea was to design a way to allow easier access and use of census data. The special tabulations program (demographic data) was created to fulfill the needs of data users that were not met by standard data products, such as summary files or public-use microdata sample files. Special tabulations were produced following the 1960, 1970, 1980, and 1990 Censuses to meet these specialized user needs.[4] In 1965, the Census Bureau established the Census Use Study Office to conduct joint projects with data users in response to the ASA suggestion. In 1967, the Census Bureau established the Data Access and Use Laboratory to develop guides, catalogs, and training manuals to assist users in locating and accessing the census data they needed. In 1968, the Census Bureau established Central User Services to create a "retail store" for receiving user requests and disseminating census data products.[5]

During the 1970s, more advances occurred in data user services as the Census Bureau reached out even more to those who had an interest in its data. All 1970 Census products were available on magnetic tape—2,054 reels of computer tape with six files, or counts, were produced. In 1971, the Census Bureau created a new division, the Data User Services Division (DUSD), to consolidate user support activities under one management. In 1973, the Census Bureau established user services units in each of its 12 Census Regional Office cities. In 1975, it developed training courses for new and advanced users to provide training to users of census data in regional seminars throughout the United States. The State Data Center (SDC) program, a cooperative program between the states and the Census Bureau, was created in 1978. This program made data available locally to the public through a network of state agencies, universities, libraries, and regional and local governments. It also created repositories for census data products in state capitals where many users need frequent and quick access to this information.

There were economic censuses in 1972 and 1977. Beginning with the 1972 economic census, most of the same statistics found in printed reports became available to data users in electronic media, initially computer tape. The 1977 economic census covered retail trade; wholesale trade; service, construction, and mineral industries; manufactures; transportation; the survey of minority-owned business enterprises (SMOBE); the enterprise statistics program; and the survey of women-owned business enterprises (SWOBE). The first survey of minority-owned businesses was conducted in 1969. A parallel survey, conducted a few years later, covered women-owned businesses for 1977. Now these two surveys, SMOBE and SWOBE, are called the Survey of Business Owners (SBO).[6]

During the 1980s, the Census Bureau was a leader among government agencies in adopting several new technologies, especially online dissemination through private providers and electronic bulletin boards. In 1982, DUSD began an electronic bulletin board to permit SDCs throughout the United States to have daily electronic access to news about census data products and "download," to their microcomputers, limited sets of census statistics. In 1984, DUSD established an online information service called CENDATA to provide users with census information by telephone modems on their microcomputers (on DIALOG and COMPSERV). In 1986, Test Disc #1 was issued, making the Census Bureau the first federal agency to produce a

[1] U.S. Census Bureau, History Web site, "Through the Decades," 1960 Overview, <www.census.gov/history/www/through_the_decades/overview/1960.html>.

[2] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, pp. 15–16.

[3] Turner, Jr., Marshall L., "Developing a User Support Program: 1965–1990 in the United States," p. 1, October 1988.

[4] U.S. Census Bureau, History Web site, Special Tabulation Program, Subjects A–Z, <www.census.gov/population/www/cen2000/sptabs/main.html>.

[5] Turner, Jr., Marshall L., "Developing a User Support Program: 1965–1990 in the United States," p. 3, October 1988.

[6] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. B-17.

CD-ROM. Between 1984 and 1988, the Census Bureau tested the preparation and dissemination of selected census data using telecommunications, flexible diskettes, compact laser discs or CD-ROMs to evaluate the feasibility of using these media as supplements to the standard published reports, computer tapes, and microfiche.[1]

In the 1980s, the agency also began working with the U.S. Geological Survey to develop an electronic database, called TIGER (Topologically Integrated Geographic Encoding and Referencing) System, which combined various map-making, coding, and related functions into a single coordinated computerized operation. The TIGERLine® Files, an extract from the TIGER System, created a whole new industry of Geographic Information Systems (GIS) software developers, vendors, and data users. Some of the data users included planners, geographers, cartographers, and others wanting to create thematic maps or reference maps.[2]

The Census Information Center (CIC) program started as a pilot project in 1988 to make census data available to underserved communities, many of which were underutilizing the information. The CIC program served to alleviate some of the access constraints that census planners believed accounted for much of the underutilization. The CIC program became permanent in 1990 and is now a very active and diverse network with almost 60 member organizations. Also in 1988, the Business and Industry Data Center program, a complement to the SDC program, was launched to fulfill requests from local businesses for economic data. It served to insure that the overall SDC program had sufficient organizations among its over 1,800 lead, coordinating, and affiliate members that could disseminate census economic data and work with the public on economic data issues.[3]

In 1980, the census short-form and long-form were introduced. The census short-form contained 7 population questions and 11 housing questions; the long-form contained an additional 26 population and 10 housing inquiries. A question on Spanish and Hispanic origin or descent was added to the 100 percent questions for the first time.

The 1982 economic census proceeded in a similar manner to the 1977 economic census with some expansions and changes. The same is true for the 1987 economic census, with many small modifications, including the publishing of some data by ZIP Codes. Starting in 1987, the Census Bureau allowed selected large firms to report their data on computer tape. The 1987 economic census was the first to be published and to disseminate data on CD-ROM. Key 1987 statistics were also published and disseminated online via CENDATA.[4]

1990–2011

In the 1990s, there were more enhancements to data user services. The Census Bureau disseminated data from the 1987 economic census on laser discs (CD-ROMs), thus opening up access to a huge database for thousands of small data users who operated only on microcomputers. In August 1990, the U.S. Government Printing Office agreed to distribute the Census Bureau's first CD-ROM products to all 1,300 federal depository libraries. This meant that the general public would have access to a vast amount of census statistics that previously would have required them to use a mainframe computer.[5] All 1990 Census results were published and disseminated on CD-ROMs. In 1993–1994, the 1992 economic census was published and disseminated on CD-ROM with 1987 historical data as a supplement.

In 1994, the Census Bureau launched an Internet site, one of the first federal agencies to do so and offer a World Wide Web portal. The Census Bureau in 1996 made the Internet the primary means of data dissemination, which allowed for quicker release of detailed data to its vast number of data users. Using the Internet in this way has led to a major expansion of Census Bureau data dissemination. The activation of this Web site marked the first time that there was "point and click" public access to its vast storehouse of statistics. In 1998, the Census Bureau announced a major expansion of data dissemination on the Internet. The American FactFinder (AFF) was launched with data from the 1997 economic census, the 1990 Census, ACS test and demonstration data, and results of the 2000 Census dress rehearsal. The AFF data access and dissemination system allowed data users to create tables and maps from this complex array of datasets. [6] During

[1] U.S. Census Bureau, History Web site, "Innovations—Technology—Publishing Results," <www.census.gov/history/www/innovations/technology/publishing_results.html>.

[2] U.S. Census Bureau, "FactFinder for the Nation: History and Organization," p. 12, May 2000.

[3] Turner, Jr., Marshall L., "Developing a User Support Program: 1965–1990 in the United States," p. 4, October 1988.

[4] U.S. Census Bureau, History Web site, "Programs," Economic Census, <www.census.gov/history/www/programs/economic/economic_results.html>.

[5] Turner Jr., Marshall L., "Developing a User Support Program: 1965–1990 in the United States," p. 6, October 1988.

[6] U.S. Census Bureau, History Web site, "Innovation—Technology—Published Results," <www.census.gov/history/www/innovations/technology/publishing_results.html>.

this period of time, some of the Census Bureau's major data user groups included the U.S. Congress; state legislatures; federal government agencies; state and local governments; national, regional, and local organizations; business and marketing sectors; academic researchers; and individuals.[1]

In the Census Bureau's FactFinder for the Nation series of brochures (produced around the period of 1990 to 2000), data users are listed for different types (by subject area) of census data. The data users most often cited include: federal government agencies, state and local government agencies, trade and professional associations, chambers of commerce, marketing cooperatives and associations, manufacturers, media, businesses, colleges and universities, nonprofit organizations, and individuals.

In the 1990s, the Census Bureau developed electronic data collection methods. New interviewing techniques, including computer-assisted personal interviewing (CAPI) and computer-assisted telephone interviewing (CATI), made it easier for respondents to participate in the various surveys. Electronic reporting, employing computer tape, diskettes, e-mail, and electronic questionnaires, made it easier for businesses to respond to economic surveys and censuses.[2]

The 1990 Census had a short-form with 13 questions and a long-form with 45 questions. Because of CD-ROMs, detailed census data, which for several decades had been available to organizations with large mainframe computers, were made accessible to anyone with a personal computer. As in 1980, 1990 Census data were available in print, on computer tape, and on microfiche. In addition to these media and CD-ROM, selected data were also made available online through two vendors of online services—DIALOG and COMPSERV.[3]

The latest major expansion of the economic census took place in 1992, when the Census Bureau added more transportation industries, finance, insurance, real estate, communications, and utilities—a group accounting for more than 20 percent of the gross domestic product.[4] The responsibility for the census of agriculture was transferred from the Census Bureau to the U.S. Department of Agriculture, National Agricultural Statistics Service (NASS) in 1995. The 1992 census of agriculture was the last agriculture census conducted by the Census Bureau with the NASS being responsible for the 1997 and future censuses of agriculture. The 1997 economic census was the first major statistical program to use the North American Industry Classification System (NAICS). Developed cooperatively by the United States, Canada, and Mexico, NAICS replaced the older Standard Industrial Classification (SIC) system, providing for greater comparability with international statistics. The 1997 economic census was the first to make all published data accessible on the Internet.[5]

The 2000 Census was conducted on April 1, 2000. The short form contained only seven questions, the shortest census questionnaire since 1820. The long form asked 52 questions of 1 in 6 households (approximately a 17 percent sample of the population). In previous censuses, responses to the race question were limited to a single category. In 2000, for the first time, respondents could check as many boxes as necessary to identify their race. A 1996 law mandated a new question on grandparents as care givers. Questions on disability were expanded to include hearing and vision impairment and problems with learning, remembering, or concentrating. Questions on children ever born, source of water, sewage disposal, and condominium status, were dropped. The 1990 census short-form question on rent and property value became a long-form question.[6]

There were additional options for responding to the census. People receiving the short form could respond on the Internet, and about 70,000 households did so. Telephone questionnaire assistance centers provided questionnaire help in six languages and took responses to the short form over the phone.[7]

There were a number of efforts to improve participation in the 2000 Census. To counter a decline in the questionnaire mail-back rate, the Census Bureau embarked on an aggressive paid advertising campaign, awarding a $167 million contract to the Young and Rubicam Company for national and local print, television, and public advertising campaign. This campaign consisted of more than 250 television, print, radio, outdoor, and other advertisements in

[1] Paez, Adolfo L., "U.S. Census Data Uses," *Statistical Journal of the United Nations, ECE 9,* pp. 325–337, 1992.

[2] U.S. Census Bureau, History Web site, "Innovation-Data Collection-Counting the Population," <www.census.gov/history/www/innovations/data_collection/counting_the_populationl.htm>.

[3] U.S. Census Bureau, History Web site, 1990 Overview, <www.census.gov/history/www/through_the_decades/overview/1980.html>.

[4] Gauthier, J. G., U.S. Census Bureau, "History of the 1997 Economic Census," Appendix B, p. 21.

[5] U.S. Census Bureau, "History and Organization," *FactFinder for the Nation Series,* CFF-4, p. 5, May 2000.

[6] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2000.html>.

[7] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2000.html>.

17 languages, and it reached 99 percent of all U.S. residents. By the end of the campaign, the census message—"This is your future. Don't leave it blank."—had been seen or heard an average of 50 times per person. The Census 2000 Partnership Program, a component of the integrated communications campaign, was the most aggressive, innovative, and inclusive program of its kind in government history. It engaged partners and stakeholders; was customized and localized to address the concerns and challenges of communities "where they were"; and with adequate technology and assistance, took ownership of the census and developed materials and outreach campaigns that program directors felt were the most effective for their constituents. By Census 2000, the Census Bureau had developed partnerships with more than 141,000 organizations involved in a wide range of activities, from Complete Count Committees to community-based organizations. The agency has concluded that the advertising campaign, the public relations effort, and other promotional and community outreach activities made a valuable contribution to increasing the final national mail response rate from 65 percent in1990 to 67 percent in 2000.[1]

During this period of time, a list of our data users was published in a 2003 paper by Gloria Gutierrez entitled "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination." The types of data users listed were federal government, state governments, local governments, schools and universities, researchers and analysts, the media, businesses, special interest groups, and individuals.[2] In Web user surveys conducted between 2000 and 2008, census data users included the federal government; state and local governments; colleges and universities; market research, advertising, and consulting; other businesses; individuals; finance, insurance, and real estate; trade and professional associations; retail and wholesale companies; the media; religious, civic, or political; and other colleges and universities.

The Census Bureau used the Internet and DVD-ROM for dissemination of Census 2000 data. Starting in 1987, the Census Bureau allowed selected large firms to report their data on computer tape. The 2002 economic census was the first to allow virtually any firm to file electronically. For 2002, the economic census switched from CD-ROM to DVD-ROM, but then discontinued all publication on discs for 2007, as broadband Internet access made discs unnecessary. Printed reports, which were the only method of publication for economic census data for more than 150 years, were reduced substantially for 1997 and discontinued altogether in 2007. The 2007 economic census data were published entirely via the Census Bureau's AFF.

The Longitudinal Employer-Household Dynamics (LEHD)/ Local Employment Dynamics (LED) programs—started at the Census Bureau to provide new time series data created under the federal-state LED partnership—provide unprecedented details about America's jobs, workers, and local economies and communities. State and County Quick Facts, which summarizes population and business statistics for every state and county in the country, became available on the Internet site.

For the 2010 Census, the questionnaire was one of the shortest in history—asking just 10 questions of all households in the United States and Island Areas related to name, gender, age, race, ethnicity, relationship, and whether you own or rent your home. Collection of data about education, housing, jobs, etc., collected by previous censuses on long-form questionnaires were collected by the U.S. Census Bureau's annual American Community Survey (ACS).[3]

In addition to the reduced number of questions, the Census Bureau announced it would count same-sex married couples in June 2009. When noting the relationship between household members, same-sex couples who are married could mark their spouses as being "Husband or wife," the same response given by opposite-sex married couples. An "unmarried partner" option was available for couples (whether same-sex or opposite-sex) who were not married.[4]

Following the successful Integrated Communications Campaign of Census 2000, the 2010 Census campaign featured a $133 million, 4-month advertising campaign. Although officially beginning January 18, 2010, the advertising campaign debuted the night of

[1] U.S. Census Bureau, "History: 2000 Census of Population and Housing," Chapter 4, *Partnership and Marketing*, p. 207, December 2009.

[2] Gutierrez, Gloria, "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination," September 25, 2003.

[3] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2010_overview_1.html>.

[4] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2010_overview_1.html>.

January 17 during NBC's Golden Globe Awards broadcast.[1]

In total, the 2010 Census advertising campaign included television, radio, print, outdoor, and Internet advertising, produced in an unprecedented 28 languages. More than half of the budgeted advertising would target media consumed by minority and ethnic audiences. The Census Bureau anticipated that the campaign would reach the average person 42 times with messages about the importance of participating in the census.[2]

From Super Bowl XLIV and the 2010 Winter Olympics to popular primetime shows, the 2010 Census advertising campaign represented the most extensive and diverse outreach campaign in U.S. history. The advertising rollout also included updates on other outreach efforts, such as the Census in Schools program, "Portrait of America" Road Tour, and the national and regional partnership programs targeted at reaching hard-to-count populations.[3]

Other key elements of the 2010 Census Integrated Communications Campaign included:

- A national road tour with 13 vehicles traveling to key events across the country, such as NASCAR races, the Super Bowl, and parades.
- A 2010 Census Web site (that included a social media component) located at <http://2010census.gov>.
- "Teach Census Week" in schools nationwide in February, part of the Census in Schools program.
- Nationally broadcasted public service announcements airing nationwide.
- Outreach activities launched by national and local corporate, foundation, government, and nonprofit organizations.[4]

Following this widespread awareness campaign, households received an advance letter in the mail before April 1, 2010. The letter told them about the census and the ways they could participate, using English or other language methods. Shortly thereafter, they received a census questionnaire in the mail. A reminder postcard followed the questionnaire mailing, and, finally, those households that had not yet responded were sent a second questionnaire. In selected areas, the questionnaire package was bilingual in English and Spanish. In addition, there were in-language questionnaires (for multiple languages) available upon request.[5]

In December 2010, the U.S. Census Bureau released 5-year ACS estimates for the first time, making social, economic, housing, and demographic statistics available for every community in the nation. Up until now, small geographic areas had to rely on outdated 2000 Census figures for detailed information about the characteristics of their communities. Consisting of about 11.1 billion individual estimates and covering more than 670,000 distinct geographies, the 5-year ACS estimates give even the smallest communities more timely information on topics ranging from commute times to languages spoken at home to housing values.

On December 21, 2010, the U.S. Census Bureau delivered the 2010 Census population counts and apportionment counts to the President.

In January 2011, the Census Bureau published a preliminary estimate of poverty, using a new definition. It was 16 years in the making, but is not quite finished yet. The "supplemental poverty measure" (SPM) will not replace the official one, which is used to determine eligibility for government programs. Rather, it will provide a better understanding of America's poor by measuring both the needs of families and the effect of government help. Also in January 2011, the Census Bureau announced a reinvented AFF, making online access to 2010 Census data and many more statistics easier than ever. The new AFF offers a fresh look, new tools, and easier access to a wide range of Census Bureau statistics. When fully implemented, it is projected to have about 250 billion data cells in more than 40,000 tables. The launch of this revamped tool was timed for the release of the 2010 Census redistricting data. By April 1, 2011, the American people will have 2010 Census data for more than 9 million census blocks and more than 74,000 census tracts. More datasets will be loaded to the new AFF during the coming year. It has a more robust, powerful search engine, enhanced table manipulation features, advanced mapping capabilities, and enhanced address search functions. This is an excellent example of bringing better data user services to the census data user community.

In early 2011, the agency began taking steps to address the future needs of the data user community and to keep pace with the changes

[1] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2010_overview_1.html>.

[2] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2010_overview_1.html>.

[3] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2010_overview_1.html>.

[4] U.S. Census Bureau, History Web site, "Through the Decades," Overview of the 2000 Census, <www.census.gov/history/www/through_the_decades/overview/2010_overview_1.html>.

[5] 2010 Census Planning Memoranda Series, No. 14, p. 6, June 2003.

in technology. For example, the Census Bureau recently established the Center for New Media & Promotion (CNMP), a new office responsible for coordinating, developing, and implementing ongoing integrated communications and promotional campaigns for the Census Bureau. This includes exploring new ways of communicating through the Web, social media, and evolving communications channels, in addition to harnessing developing technologies for displaying and communicating statistical information and data. CNMP is at the core of the new outreach strategy for the entire Census Bureau.

The agency took another key step to improve its data dissemination activities by commissioning an expert review of its Web properties and an external literature review of best practices relevant to technology strategies and solutions. These efforts will help the Census Bureau to continue to fulfill its mission to be the leading source of quality data about the nation's people and economy.

In a 2012 Budget Initiative, the Census Bureau is looking to build on the successes of the 2010 Census Integrated Communications Campaign by keeping several components of the campaign going in nondecennial years to benefit other parts of the agency. Some ongoing components include:

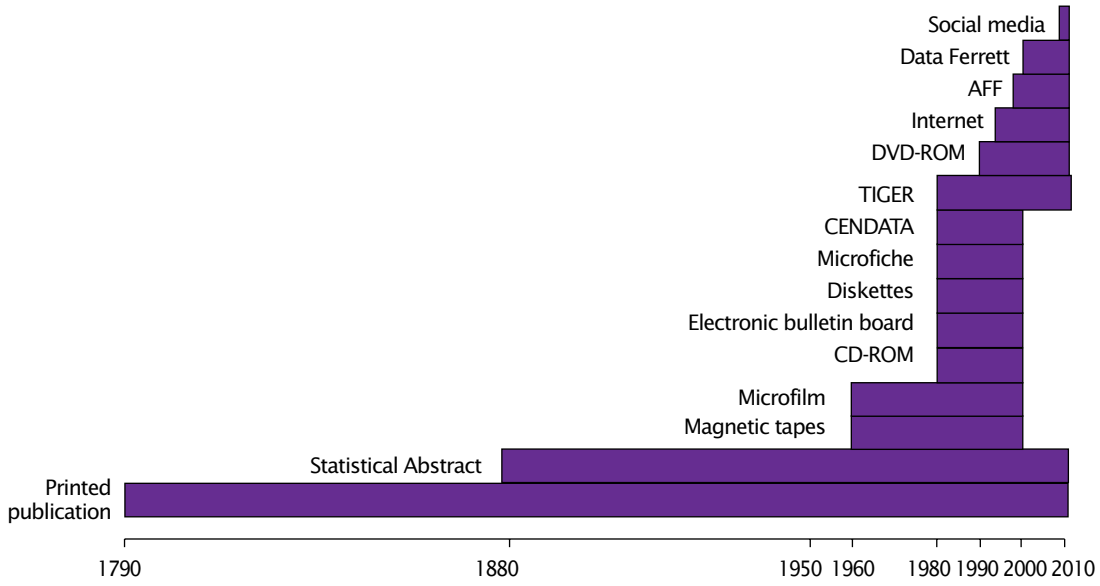
- An evergreen census in the schools program to provide ongoing outreach and support of current census programs such as the ACS and the economic censuses. The evergreen effort will expand its focus on higher grades and migrate into colleges and universities. The internet provides a great opportunity to inform students of the usefulness of census data for their studies and research.
- Expansion of our data accessibility and training programs to ensure that our data is more accessible and useful to all levels of data users. One shouldn't need to be a statistician to be able to understand and use our data. We are developing data access tools that are simple, intuitive, and readily available.
- Continuous promotion of Census Bureau programs and services throughout the other 9 years using the integrated communications approach used in the 2010 Census through emerging technologies and contracted services. This will increase the effectiveness and reach of other programs and services such as the ACS and the economic censuses.
- Maintain the Web outreach that was created with the dynamic 2010 Census Web site. This effort aims to manage the flow of Web site-based information between the Census Bureau and the general public; make information access and sharing quick, easy, and engaging; increase the Census Bureau's exposure to its various audiences using topics, news features, and functionality of public interest; and increase user participation in Census Bureau programs. Taking advantage of emerging social media tools and Web technologies will build new awareness and appreciation for Census survey programs.

The Information Technology area is working on strategies to replace the desktop PC and allow staff to access their desktops remotely. We are considering Pads and other mobile devices to replace the laptops for our 5,000 field representatives, and using Skype sessions or Facetime meetings to create an easy video teleconference with data users.

In this chapter we presented historical information on the Census Bureau's data users and data dissemination services over time. Figures 1 and 2 are a historical representation of our data users and our dissemination strategies over time. The information in these two charts was taken from the chronological history you just read and is not intended to show all census data users or data user services. For example, Figure 1 shows that throughout the history of the Census, data was disseminated in printed formats and it wasn't until the computer age starting in the late 1950s that census data was made available in any other form. Figure 1 also shows that the Census Bureau really began to democratize access to its data in the 1980s with the development of CD-ROM technology and personal computers. Figure 2 shows that the census data users broadened between 1900 and 1960 as the Census Bureau offered a wider array of information and improved its capability to process and disseminate its data. The information presented in this chapter serves as a foundation for the future and represents only a small portion of the long and rich history of the Census Bureau.

Figure 1.

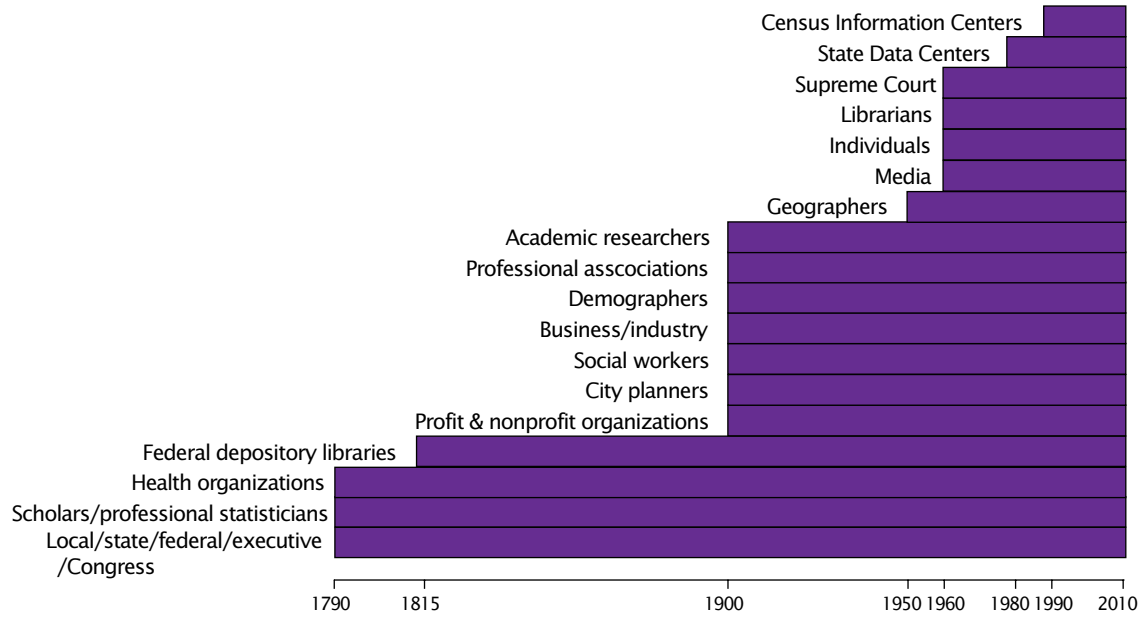
Census Data Dissemination Methods From 1790 to 2010



Source: U.S. Census Bureau, historical documents (see Chapter 1).

Figure 2.

Census Data Users From 1790 to 2010



Source: U.S. Census Bureau, historical documents (see Chapter 1).

CHAPTER 2.
THE CHALLENGE CONTINUES: THE FUTURE OF DATA USER SERVICES

In Chapter 1, we provided detailed historical information on census data users and data dissemination services over time. In this chapter, we present current information on the Census Bureau's "typical" data users and how we disseminate data to them. We also define some of the barriers data users face when accessing census data and identify ways to improve access for all audiences, especially those populations and communities with limited Internet access to and knowledge of Census Bureau data. The findings in this section are derived from the responses to three surveys conducted for this research project. There were two survey instruments: (1) a nine-question questionnaire was e-mailed to 40 Census Bureau divisions and offices and to 14 principal federal statistical agencies, and (2) the link to a five-question questionnaire using Survey Pro, a Web-based application, was e-mailed to the 22 participants in the CIC and SDC programs.

Of the 40 Census Bureau divisions, offices, and program areas, and the 14 federal statistical agencies, 93 percent and 71 percent responded, respectively. Eighty-six percent of the 22 CICs and SDCs responded.

Content analysis—also known as thematic analysis—was used to convert the qualitative responses into quantitative data for analysis (see "Methods" section). Through this method we were able to both quantitatively and qualitatively analyze the presence of certain words or concepts within the text or sets of text. The text refers to individual responses to the questionnaire—thus, the text is the data. By using content analysis, we were able to establish the existence and frequency of concepts most often represented by words or phrases in a text.

We have also included findings from the recent Census Bureau Web discovery investigation. This Web discovery investigation was composed of 17 different interviews with 22 Census Bureau staff members across 7 directorates, an expert review of the Census Bureau online presence and 11 other governmental/statistical Web sites, and a review of Census documents and external best practice literature. The interviews and Web discovery process was conducted to address the gap between the Census Bureau's current data dissemination practices and emerging best practices. The report entitled "Emerging Trends and Best Practice: The Census Bureau and Web 2.0" was reviewed as part of this project and the applicable findings are included in this chapter.

Census Data Users

Survey participants from the Census Bureau and the other principal federal statistical agencies were asked to define a data user. This question was designed to determine commonalities in how the various organizations view data users. Over 70 percent of Census Bureau divisions and offices said a data user is anyone who uses census data (see Figure 3). Eighty-nine percent of the other principal federal statistical agencies gave a similar definition. As we look more closely at the data, we see that the definition is not that simple. Based on responses by Census Bureau divisions and offices, there are three general categories within which to classify a data user: by user types, the actions they take, and their purpose (why they use data).

User types:

- **In-house/census users**
- **External users**
  - Organizations: government agencies (federal, state, local), nongovernmental organizations, trade associations, businesses, and the press/media.
  - Individuals: academics (students, teachers, researchers), policy makers, professionals, and the general public.

Thirty-seven percent of Census Bureau divisions and offices defined user type as an organization or entity with 8 percent consisting of government agencies, 13 percent businesses, 8 percent media, and 13 percent Congress/policymakers.

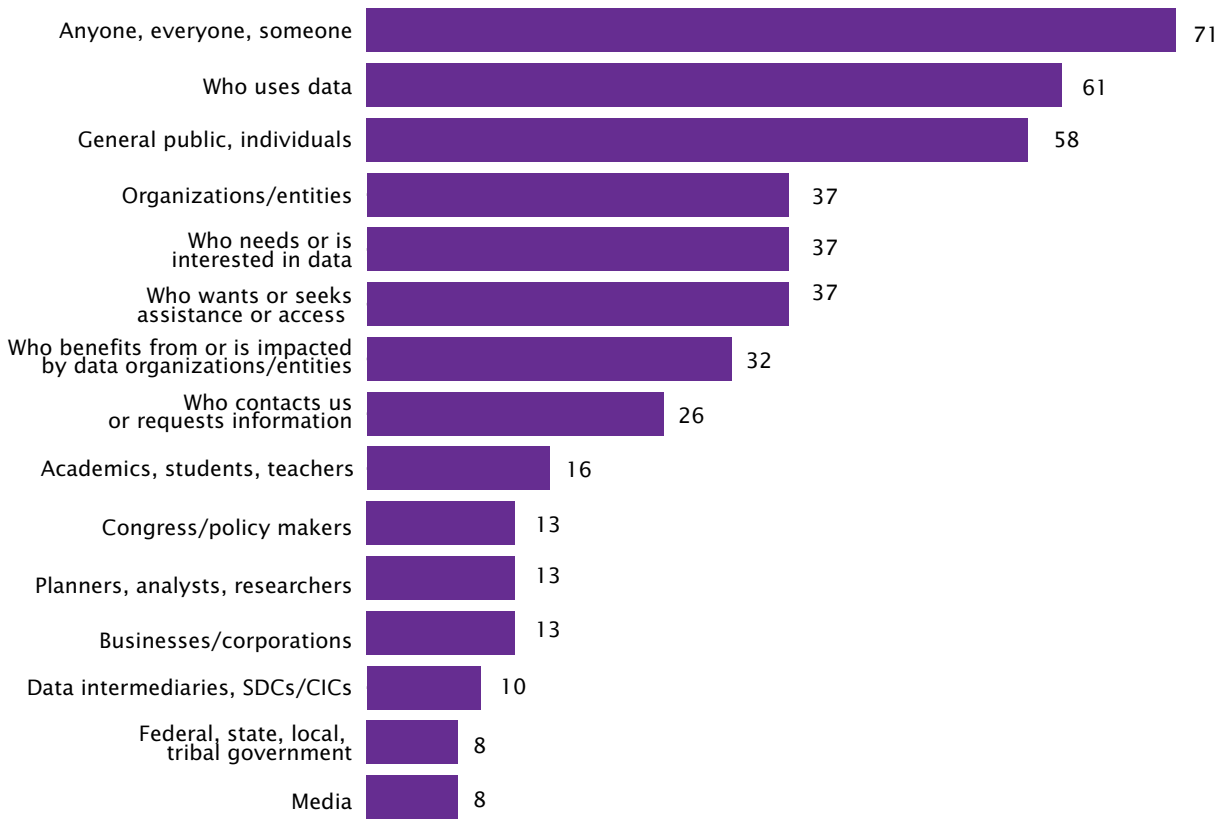
Fifty-eight percent defined the user type as individuals/general public with planners/analysts/researchers making up 13 percent, and academics/students/teachers making up 16 percent.

User actions:

- Uses/utilizes
- Accesses
- Needs/requires
- Asks/inquires
- Searches
- Analyzes
- Receives
- Requests
- Distributes
- Wants
- Contacts
- Relies upon
- Downloads
- Researches

Sixty-one percent of Census Bureau divisions and offices defined a data user as one who uses/utilizes data;

Figure 3.
What Is a Data User?
(Percent of respondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 1.

37 percent said one who needs or requires data; 37 percent as one who wants or seeks assistance; and 26 percent as one who contacts us/asks or inquires about data.

User purposes:

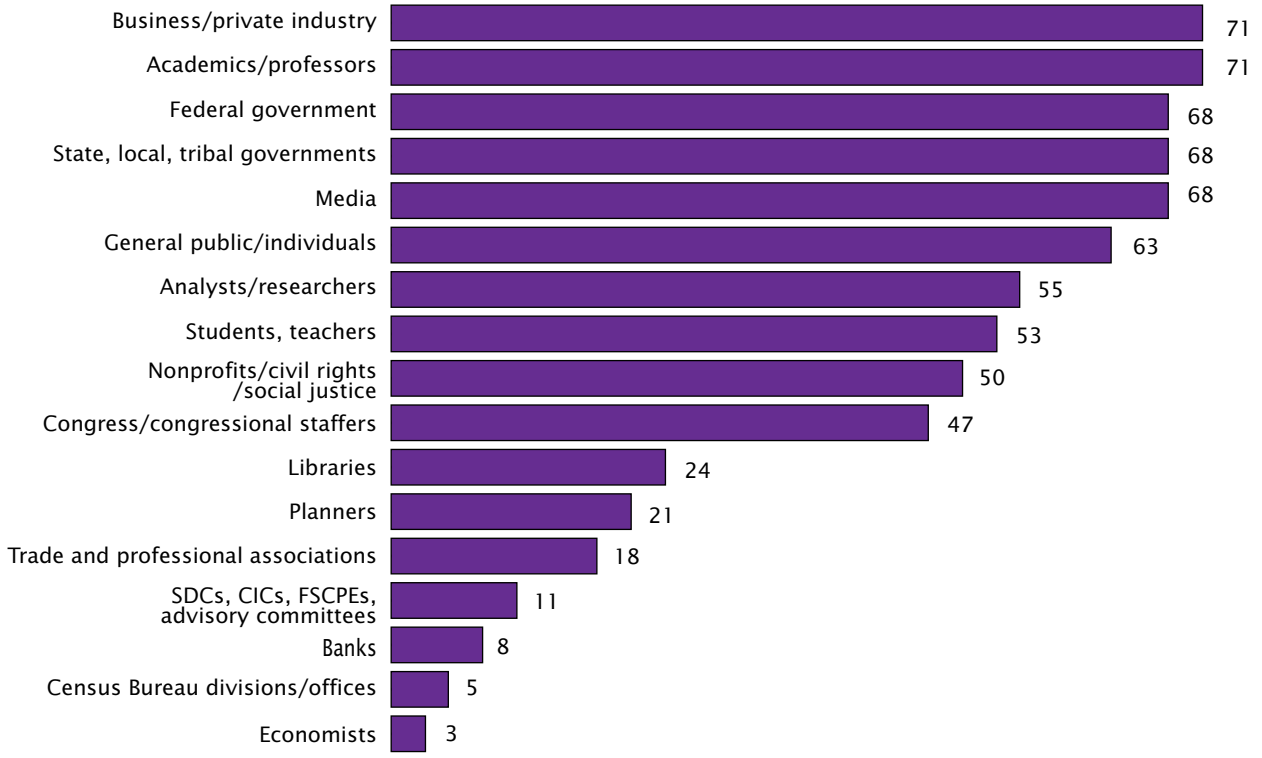
- Decision-making
- Statistical need
- Research
- Benefit to organization
- Interest in data
- Policy formation
- Data distribution/compilation
- Communications/creating a narrative
- Curiosity
- School work
- Policy implementation
- Fundraising/funding decisions

Census Bureau divisions and offices said the main purposes or reasons an organization or individual uses census data are for decision-making, statistical needs, research, and to benefit their organization.

In addition, to these three general categories of users, there was an emergence of a few trends that may be useful in more detailed analysis or research. First is the distinction between *experienced* and *inexperienced* users. We saw this emerge when certain divisions and offices discussed the levels of experience to which they catered, and when they compared and contrasted "power users" to more "general users."

A second binary was between *direct (primary)* and *indirect (secondary*) users. Primary users get their data directly from the Census Bureau, whereas secondary users get it from sources such as SDCs, data clearinghouses (i.e., IPUMS .org), journal articles, or reports in the press. An example of a primary user is someone who utilizes census data without alteration of content or format by incorporating elements of the data into other products. A good example of an indirect user is the media who weave disparate sources of information to create a story or

Figure 4.
Who Are Your Typical Data Users?
(Percent of respondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 2.

mapping data to explore geographic patterns and distributions for analysis.

Similarly, a third emergent binary can be created between *passive* and *active data* users. Passive users are those that use the benefits of census data without realizing it—taxpayers who rely on city planners' familiarity with census data to reduce gridlock for instance. Active users know that they are using census data for their purpose.

Other binary terms used include *traditional, nontraditional*, *casual,* and *curious/occasional* users. Traditional data users are those that are familiar with census data and who have been data users throughout census history. Recall the types of data users mentioned in Figure 2. They include the U.S. Congress, federal, state, and local governments, academics, researchers, businesses, and professional associations. Nontraditional/casual/curious data users are those who until recent history did not have access to census data. They can be described as a new class of data user now that census data is easier to find with the Internet and the AFF.

Respondents were asked to give details on their typical data users. Nearly two-thirds of the Census Bureau's divisions and offices said their typical data users are represented in the following 10 major categories and are depicted in Figure 4:

- Academic/university
- Business/private industry
- Media
- State/local government
- Federal government
- General public
- Researchers/analysts
- Students/teachers
- Nonprofits
- Congress/congressional staff

In addition, they identified more specific data users within these categories:

Media: print, broadcast, Internet bloggers, reporters, editors, writers, publishers, producers, Webmasters, etc.

Nonprofits: civil rights, advocacy, social justice, faith-based, churches, community-based, neighborhood groups, etc.

Researchers: academic, government agencies, nonprofits, etc.

Businesses: banks, real estate companies, mortgage companies, marketing research/consulting firms, utilities, advertising, finance, insurance, etc.

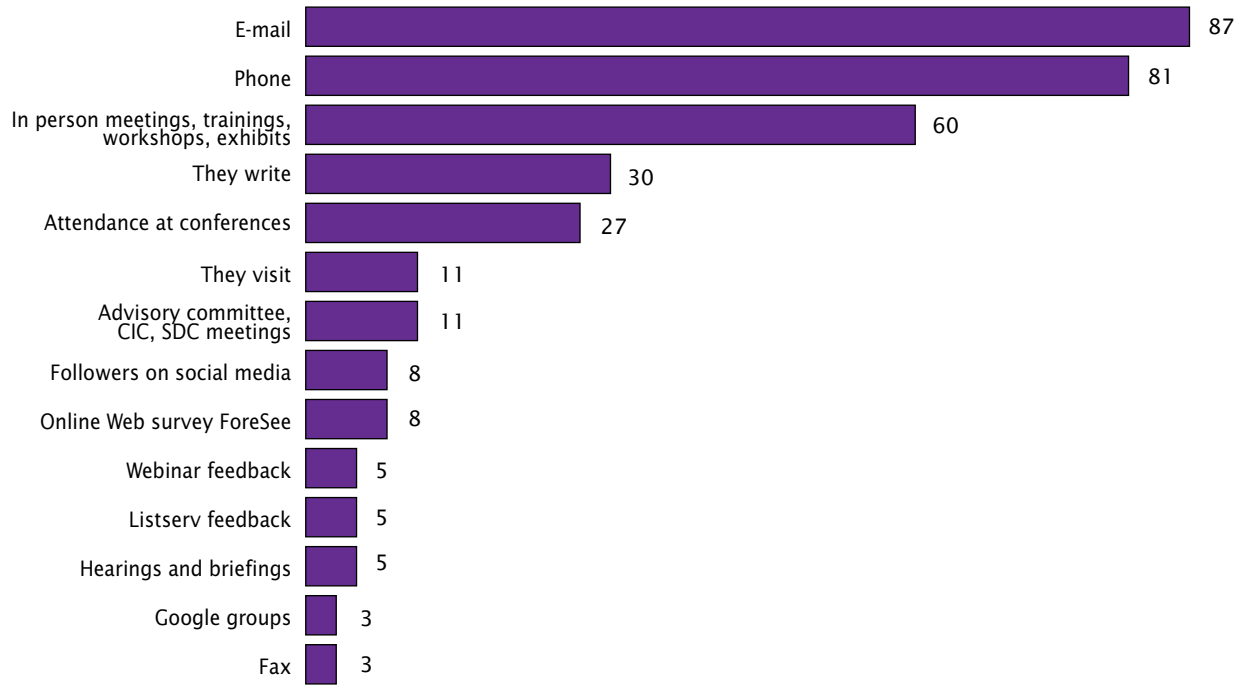
Federal government: Bureau of Economic Analysis, Federal Reserve, Council of Economic Advisors, Small Business Administration, Minority Business Development Agency, Bureau of Labor Statistics, Housing and Urban Development, National Science Foundation, National Center for Education Statistics, National Center for Health Statistics, Bureau of Justice Statistics, etc.

Other specific data users mentioned by Census Bureau divisions and offices included: think tanks, foundations, law enforcement agencies, urban planners, emergency management personnel, workforce developers, medical practitioners, doctors, consultants, grant writers, lawyers, sales persons, Geographic Information System analysts, health care providers, etc.

The other principal federal statistical agencies said their typical data users are represented in similar categories as the Census Bureau's users. However, one difference between the Census Bureau and the other principal federal statistical agencies was that a higher percentage of the other statistical agencies identified the Congress (78 percent vs. 47 percent) as one of their typical data users and a higher percentage of Census Bureau divisions and offices identified the general public (63 percent vs. 55 percent) as their typical data user.

When asked how they know who their typical data users are and the types of contacts they have with them, 87 percent of Census Bureau divisions and offices said they use e-mail as the primary method of contact with their typical data users; 81 percent also identified the telephone as a means of contacting their data users; and only 8 percent said they used social media or Web surveys to identify their typical data users (see Figure 5). For example, the typical amount of e-mail requests for the Boston Regional Office is about 350 to 400 data inquires a month. During the first quarter of 2010, the Foreign Trade Division reported receiving

Figure 5.
How Do You Know Who Your Typical Data Users Are? What Kinds of Contact Have You Had With Them?
(Percent of respondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 3.

over 1,500 e-mail requests and 297 postal mail requests.

The other principal federal statistical agencies provided similar responses to the question on the types of contact they have with their data users. They use e-mail (89 percent); telephone contacts (89 percent); direct interactions (in-person meetings, workshops, training, conferences, etc. [67 percent]); Web surveys (ForeSee ACSI, 44 percent); evaluations from data user conferences (44 percent); and advisory committees/stakeholder engagement (44 percent). In some cases, anecdotal information is gathered from participation at trade shows, meetings, etc. Census Bureau divisions and offices also mentioned that their knowledge of their data users is based on their long-term and on-going relations with their data users. Some divisions and offices have used subscription services, focus groups, independent studies, and Google Groups to gather valuable feedback from their data users.

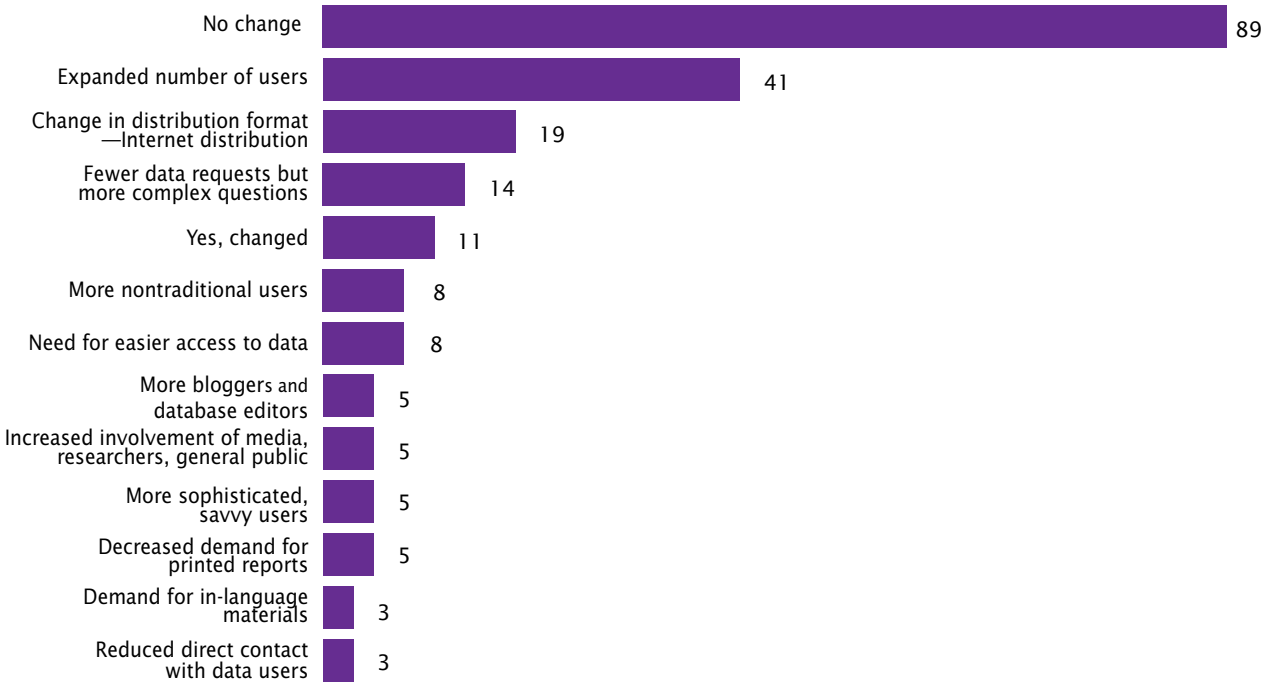
Several divisions and offices reported that, while they know a lot about some of their data users, the introduction of American FactFinder (AFF) and the Internet has also caused many of their users to remain anonymous.

When asked historically who their data users have been and if they have changed over time, 89 percent of Census Bureau divisions and offices said their data users have not changed (see Figure 6). However, 41 percent said the number of users has expanded as the dissemination format changed to the Internet. In addition, they reported an increase in the number of nontraditional data users and a corresponding decrease in the number of data requests. However, the requests they receive are now more complex and require more guidance and assistance.

While Census Bureau divisions and offices said historically their data users have not changed, they listed the following types of historical data users:

- Researchers (all spectrums)
- University students
- Government employees

Figure 6.
Historically, Who Have Your Data Users Been? If it Has Changed, How?
(Percent of respondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 4.

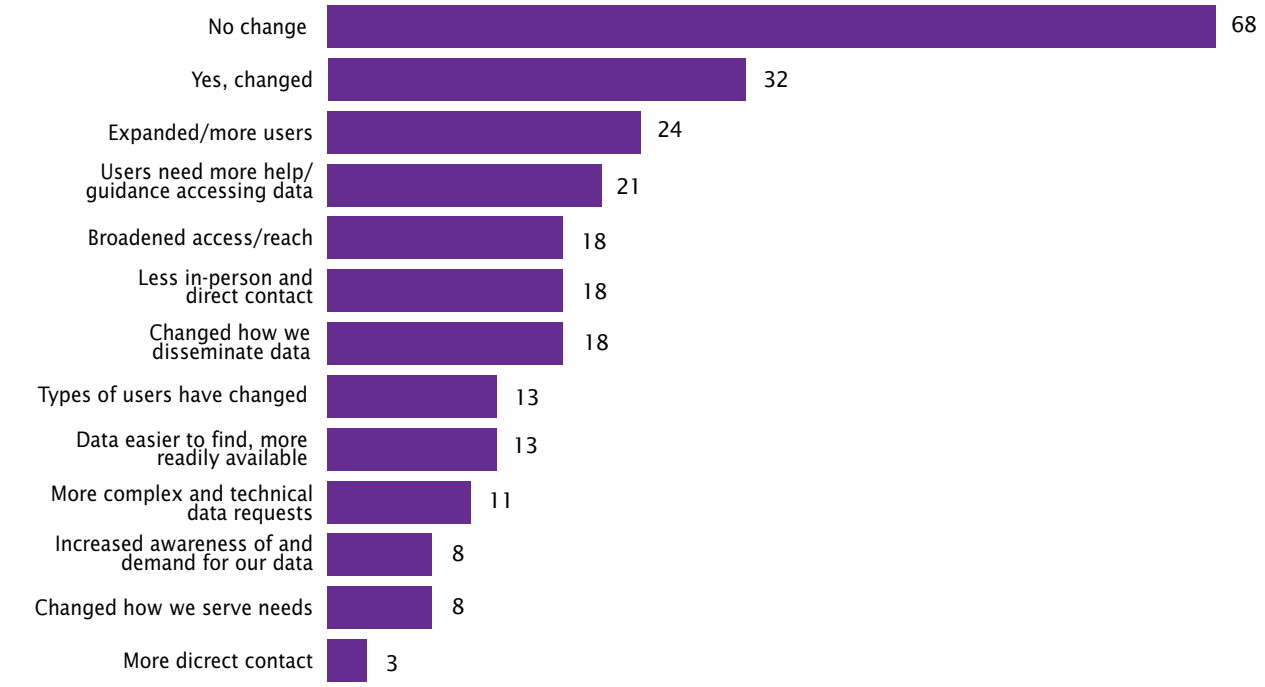
- Federal, state, and local governments/Congress (Congressional Research Service)
- Journalists
- Librarians
- Community organizations
- Anyone with an Internet connection

Census Bureau divisions and offices also said that they have seen an increase in the number of microdata users as microdata has become easier to use; their relationship with data users has changed as self-service options have become available; the increase in new users has created an additional layer of burden to train and educate; there are more barriers between the analyst and the media; questions from data users were more one-dimensional, but now involve four subject areas to answer; their data users are more sophisticated and savvy users; and there are more nontraditional data users.

About half of the other principal federal statistical agencies reported that historically their data users have not changed. Those reporting a change in their data users made the following comments: the number of users has expanded and the user base has broadened; there are more general audience users with a wide range of needs; data users have more immediate needs such as quick facts and data visualizations (i.e., charts and summary tables); their Web trend data and Ask.gov e-mails show more international users; there has been an increase in lay vs. expert users; and there are more users of automated scraping programs (robots).

Respondents were asked if the Internet had changed their definition of a data user. Over two-thirds (68 percent) of Census Bureau divisions and offices said the availability of data over the Internet has not changed their definition of a data user, however, 32 percent stated that the Internet has changed how they define a data user (see Figure 7). When discussing how it changed their definition, 24 percent said it has expanded the number of data users; 21 percent said users need more help and guidance accessing data; 18 percent said that the availability of data over the Internet has broadened access and reach; 18 percent said there is less

Figure 7.
Has the Availability of Data Over the Internet Changed How Your Office Defines a Data User? How?
(Percent of respondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 5.

face-to-face contact with users; 13 percent said the Internet has made it easier to find data; and 8 percent said the Internet has increased awareness about the Census Bureau.

The Census Regional Offices (ROs) reported that once the public was able to access the AFF, the number of people walking in and asking questions declined. Fewer data users visit their offices or call them on the telephone, thus making the data user more "invisible."

The ROs also said the Internet has allowed for a much wider variety and larger number of individuals to fall into the category of a data user. They not only must cater to the traditional data user that they have serviced over the decades, but they must meet the needs of the causal nontraditional data user.

Both Census headquarters divisions and offices and the ROs said that Internet and other technologies have increased the consumer pool, increased the complexity of the questions, and changed how the data are delivered. In the past, inquiries were more one dimensional, for example: (1) How many African Americans lived in a specific city or area? and (2) How many people in my town have a college education and above? Today, more complex questions are being asked that require the use of multiple datasets.

Census Bureau respondents reported that there are fewer users of printed reports, DVDs, and CD-ROMs, having been replaced by Web pages and online data access tools with potentially hundreds of users. They also cite AFF for the increase in the number and diversity of the data user. They said that with the Internet, access has become more universal in offices and homes, and that Google, other search engines, and data mining tools have reduced the necessity for face-to-face encounters.

Fifty-six percent of the other principal federal statistical agencies said their definition of a data user has not changed because of the Internet. However, they said the Internet has expanded the number of users, broadened access, and increased the number of casual/nonexpert users. One federal agency reported that because of the Internet, there is more competition for their information because there are more sources for the data. As a result, they are continuously evaluating and enhancing their products suite and developing more tools such as Podcasts and audio slide shows; conducting more in-depth research; providing more brief and influential highlights of their data; and developing more multimedia products.

Respondents from the Census Bureau and the other principal federal statistical agencies expressed concerns about how to address the challenges of meeting the needs of data users with very different levels of understanding and ways of using data. For example, respondents cite school children, foreign users, and casual users need more guidance and assistance, while expert users have more complex requests. The Census Bureau's challenge is to develop cost-effective strategies to deliver useful information to all of our customers.

The "Typical" Census Data User

One of the purposes of this study is to define who the Census Bureau's "typical" data users are. It is important that we know who our data users are if we are to fulfill our mission to be the leading source of quality data about the nation's people and economy. We must recognize that our data users are varied and diverse, and our services and products should address all of these needs from the least experienced to the most experienced data user. This information will also be helpful as the agency moves forward with product development in the future.

We used Information from the following sources to help us define the major categories of census data users:

- Historical Data Users Survey responses from Census Bureau divisions and offices to question number 2, "Who are your typical data users?" (see Figure 4).
- Article by Aldofo L. Paez entitled "U.S. Census Data Users," published in the *Statistical Journal of the United Nations Economic Commission for Europe*, 1992.
- Paper by Gloria Gutierrez entitled "Analysis and Recommendations: U.S. Census Bureau Customer Communications and Data Dissemination," 2003.
- Census Bureau Web Visitors Surveys Results, 1997–2008.
- Census Bureau "FactFinder for the Nation" Series, 1990s.

The following is a brief description of each of these sources, how we used them, and how they defined the census data user:

- Historical Data User Survey, Question 2, "Who are your typical data users? (see Figure 4).
- The article by Aldofo L. Paez entitled: "U.S. Census Data Uses" examines the principal applications and uses of recent censuses with a focus on the 1990 Census of Population and Housing. According to the article, the Census Bureau was at a crossroad with regard to how it would conduct the next census

and which data needs it would satisfy in the year 2000 and beyond. The Census Bureau was responsible for assessing and reconciling data users' interest across the nation, while trying to balance the priority of its constitutional mandate and the statistical needs of federal agencies. In examining the uses of census data, Mr. Paez identified census data users based on their Constitutional or legislative need for census data. For example, he identified the U.S. Congress as the "First Data User" because census taking in the United States is rooted in the Constitution and the census is the legacy of the nation's founders. Within 9 months after the census, in response to the Constitutional requirement, the Census Bureau must deliver the apportionment counts to the President. The apportionment following each census is a profoundly important political application of census data. State Legislatures were identified as "the 50 Major Users" because the legislatures of each of the states are among the earliest recipients of census data. They receive census data at the block level for redistricting e.g., redrawing the geographical boundaries of election districts within each state to reflect population changes and shifts since the last census. Federal government agencies were identified as "the Billionaire Data Users" because the U.S. Congress empowers executive branch departments and agencies to administer programs entailing the allocation of federal funds. Covering such diverse areas as agriculture, housing, mass transit, nutrition, and the arts, some of these federal grant programs require the use of decennial census data for making funding eligibility determinations or in formulas for calculating grant levels. Census data is used to distribute over 4 billion dollars in grant money each year. With billions of dollars at stake, it is understandable why federal government departments and agencies have a preeminent role in determining the content of the census questionnaire. State and local governments or "the Front-Line Data Users" were identified because virtually every state, city, and county planning agency in the United States uses census data in its work. Also under the federal form of government in the United States, states and localities enjoy sovereignty over major government functions such as public education, roads, transportation, hospitals, etc. National, regional, and local organizations were identified as "Amateur to Professional Data Users" because they use census data for a variety of reasons such as petitioning for the establishment of branch libraries, parks, and child care facilities. The business and marketing Sectors were referred to as "Data Users Can Make Money." Large and small businesses are major users of census data, generally for purposes related to decision-making such as: where to situate factories, stores, and other facilities; targeting product lines and advertising; assessing the feasibility of success in a prospective market; and evaluating an area's labor pool, including its age structure, educational profile, industry/occupation experience, income, and so forth. "Academic Researchers—Tracking America for Two Centuries" were identified because census statistics are the treads that bind a number of academic disciplines such as history, demography, economics, sociology, anthropology, geography, political science, and others. Researchers in these disciplines, including many who work outside of academia (eg., government agencies), give meaning to the census numbers through their analysis of structural changes and migration patterns of the population in general or of specific subgroups. Lastly, he identified "Individuals—Personifying the Census Respondents" because genealogists—be they professional researchers or simply individuals giving form to their family tree—are among the most avid users of census data. They use census data to trace the descent, succession, and/or migration of individuals, families, or groups.[1] We used the list of data users from this source in the priority order in which they were used in the document.

- The report by Gloria Gutierrez issued in 2003 entitled "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination," examined the agency's approach to data dissemination from an internal and external environment. It analyzed the pros and cons of the Census Bureau's organizational style/structure for data dissemination and outreach; the agency's financial environment and internal pressures to consolidate to contain costs; the agency's overlapping services including individual Web sites and programs; and the external pressures from the government and the public to provide better services in a changing customer service landscape. The report

[1] Paez, Aldolfo L., "U.S. Census Data Users," *Statistical Journal of the United Nations*, ECE, pp. 329–335, 1992.

concluded that many consumers of census data—the U.S. Congress, the media, individuals, researchers, businesses, public planners and policymakers, as well as those who should validate the importance of the Census Bureau and its products to the U.S. Congress and the public—are not well informed as to the range and depth of the Census Bureau's contributions to the economy and the public. There were several reasons cited for these situations: (1) Product design and dissemination at the Census Bureau were done from a program/survey perspective rather than a data user perspective. The Census Bureau has not applied an enterprise-level, coordinated, and consistent policy and focus around the needs of the data users when designing data products, and (2) There was no coordinated effort within the Census Bureau to understand, consult with, and communicate with the key user groups about their data needs. Each of the many Web sites within the Census Bureau generally disseminates data only for a single program. To get data, users must understand both the Census Bureau's organization as well as our specialized language in order to locate and interpret the data they need. The document further states how the Census Bureau has closely analyzed the public as survey respondents by recognizing the importance of response rates and of keeping data both confidential and nonpolitical, and by demonstrating significant improvement each decade in the differential undercount of targeted minority populations. However the Census Bureau has not applied the same level of scrutiny to the public's needs as consumers of census data. In addition, there was no methodical, comprehensive approach either to communicating the needs of data users to the Census Bureau or the capabilities of the Census Bureau to the data users. This has resulted in communication overlaps and gaps, with some groups being contacted by several divisions and some being overlooked entirely.[1]

To solve the problem, the report made a number of recommendations: (1) the Census Bureau should take a market research approach to data dissemination, analyzing user needs and applying this knowledge to customer service and data dissemination program planning; (2) the Census Bureau needed to gather and analyze user information requirements through such methods as analysis of user traffic on existing Census Web sites, user surveys and feedback, interviews, advisory committee discussions, and focus groups; (3) the range of users and their requirements should be categorized and prioritized, and data dissemination services planned to meet each user segments needs; (4) best practices from the public and private sectors as well as the international arena should be evaluated for applicability at the Census Bureau; and (5) the potential role of technology in data dissemination should be thoroughly analyzed.[2]

There is a section in the report on "Analyzing the Customer," where the following recommendations are made: (1) Using a range of techniques such as surveys, user feedback, analysis of customer logs, interviews, focus groups, stakeholder meetings and other approaches, the Census Bureau should develop as full as possible an understanding of the characteristics of its current and potential customers; (2) Recognizing that these diverse users will not be satisfied with a single, monolithic approach to data dissemination and customer support, the Census Bureau should group its customers by common characteristics and estimate the size priority for each customer segment; and (3) Future dissemination and customer support services should be planned around the needs of each major segment.[3] Appendix A of the report included references to the user segmentation studies done by the Data Access and Dissemination Systems (DADS) Office in support of the American FactFinder—the Census Bureau's primary data dissemination system. It was suggested that the list of users serve as a base for the customer segmentation for the entire Census Bureau. Appendix C lists the following consumers and their sample uses of census data: federal government, state governments, local governments, schools and universities, researchers/analysts, media, businesses, special interest groups, and individuals.[4] We used this source because the list of data users was based on research.

[1] Gutierrez, Gloria, "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination," p. 4, September 25, 2003.

[2] Gutierrez, Gloria, "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination," p. 5, September 25, 2003.

[3] Gutierrez, Gloria, "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination," p. 14, September 25, 2003.

[4] Gutierrez, Gloria, "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination," Appendix C, pp. C-1–2, September 25, 2003.

- Another source that was used is the Survey of Census Bureau Web site Customers From 1997–2008. The survey was designed to collect specific information about Web visitors' characteristics, preferences, habits, and satisfaction levels with the Census Bureau's Web site and with particular functions and features of the site. We looked at the percentages of how respondents classified themselves for each year the survey was conducted. We added the percentages and came up with an average over time. The categories of users with the highest average percentage were used to determine the major catergories that represented the Census Bureau's "typical" data user from this source. There were some inconsistencies in the data for this source. While many of the questions remained constant throughout the various surveys to allow for comparative analysis, new questions were added after 2002. For example, users were given more choices to identify the business sector that best described their work. Also no data was found for 1999 and 2007. Web surveys were discontinued after 2008 and were replaced by quarterly reports from the American Customer Satisfaction Index (ACSI), a national economic indicator of customer evaluations of the quality of goods and services available to household consumers in the United States.
- Lastly, we used information from the Census Bureau's FactFinder for the Nation Series. The FactFinder for the Nation is a series of pamphlets containing information on various census data collection efforts (program areas) and products, such as Housing Statistics, Population Statistics, Retail Trade Statistics, Foreign Trade Statistics, Statistics of Manufacturing, etc. In each of the pamphlets, there is a section on who uses the data. The information on who uses the data was coded by program area/data collection effort. The types of data users were ranked based on those that received the highest number of occurrences. For example, federal, state, and local governments were identified as users of all data collection/program areas of the Census Bureau. This was followed by trade and professional associations, chambers of commerce, and marketing cooperatives and associations (forecasters, researchers, and consultants). We used the data user categories that received the highest number of occurrences across program areas as a source for defining the "typical" census data user.

Table 1 below lists the major categories of data users, in priority order, from each of these sources. To determine the Census Bureau's "typical" data users, we looked at the categories of data users from each of the individual sources and selected the top 10 categories with the highest number of occurrences across all sources. The Census Bureau's "typical" data users are represented in the following 10 major categories by priority: federal government; state and local government; businesses; academic institutions; national/regional/local organizations; trade and professional associations; media; researchers; individuals; and the U.S. Congress.

Table 1.
Major Categories of Census Data Users From Five Independent Sources

Historical Analysis of Data User Services and Data Users Survey, Question #2 (see Figure 4), 2011	Gloria Gutierrez, "Analysis and Recommendations: U.S. Census Bureau Customer Communication and Data Dissemination," paper, 2003	Web Visitors Survey, 1997–2008	Aldolfo Paez, "U.S. Census Data Users," paper, 1992	FactFinder for the Nation Series, 1990s
Academic universities	Federal government	Federal, state, and local governments	Congress	Federal government
Businesses	State government	Colleges and universities	State legislatures	State and local governments
Federal government	Local government	Individuals	Federal government	Trade and professional associations
State and local governments	Schools and universities	Businesses	State and local governments	Chambers of Commerce
Media	Researchers/analysts	Marketing, advertising, and consulting	National, regional, and local organizations	Marketing cooperatives and associates
Individuals	Media	Finance, insurance, and real estate	Business/marketing sectors	Manufacturers
Researchers/analysts	Businesses	Trade and professional associations	Academic researchers	Media
Students and teachers	Special interest groups	Media	Individuals	Businesses
Nonprofits	Individuals	Religious, political, and civic organizations		Colleges and iniversities
Congress/congressional staffers				Nonprofits
				Individuals

Data Access and Dissemination Methods

When asked to list the ways data are made available to their data users, Census Bureau divisions and offices said data are available to their data users through the Internet, e-mail, telephone, etc., (see Figure 8 for a complete listing). While Census Bureau program areas identified the Internet as their primary means of disseminating data to their users, findings from the recent Web discovery investigation identified significant issues with the agency's capacity to communicate information to its customers via the Internet. Specifically, the investigation found the following issues with the Census Bureau's Internet dissemination efforts:[1]

- There are fragmentation and presentation issues with the Census Bureau's Web site. The different layouts, styles, file formats, and navigation structures throughout Census.gov create a confusing and disappointing online experience for customers.
- The Census Bureau misses many opportunities for communicating with customers through data storytelling and visualization (e.g., interactive maps and graphics).
- A lack of customer focus. Most Census Bureau staff members do not have access to feedback from Census Bureau customers

[1] Abt Associates, "Emerging Trends and Best Practice: the Census Bureau and Web 2.0," p. 6, April 1, 2011.

and have only a limited view into each customer group's specific interests.

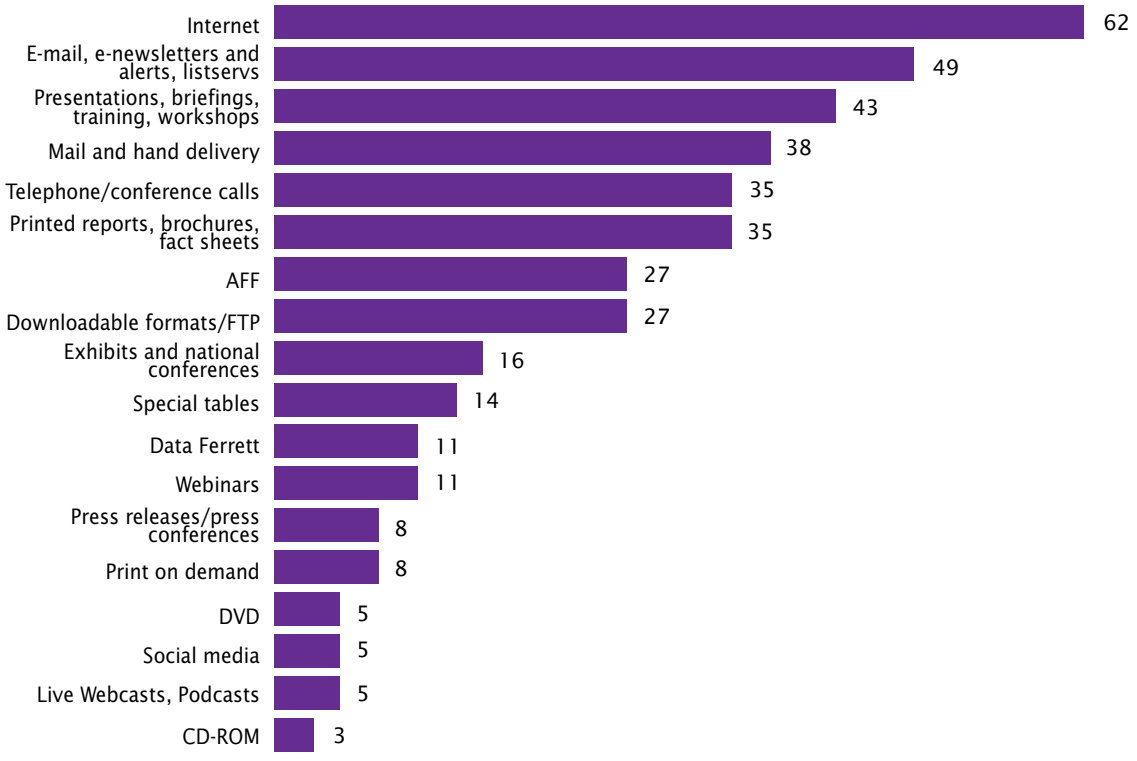
Survey respondents from the Census Bureau and the other principal federal statistical agencies stated that because of the availability of the data on the Internet, they have received fewer walk-in visitors and telephone requests than in prior years. The requests they've received, however, are more complex.

The other principal federal statistical agencies were also asked to list the ways they make information and data available. Their most frequently occurring responses are the same as those for the Census Bureau. They included: Internet/Web sites, e-mails (including subscription-based e-mails, listservs, e-mail alerts, e-newsletters), podcasts, RSS feeds, mobile browsing, Twitter, XML Web services to push updates to subscribers and data miners, scientific journals, printed reports, brochures, and fact sheets.

Census Bureau divisions and offices and the other principal federal statistical agencies were asked how their data dissemination strategies have changed over time. Census Bureau respondents reported that prior to the 1980s, data was disseminated through printed publications, photocopying, microfiche, and magnetic tapes. In the 1980s, an electronic bulletin board was created to permit the Census Bureau partners in the SDC program to have daily electronic access to news about census data products. The bulletin board made it possible for the SDCs to download limited sets of census statistics to their microcomputers. During this same time, CENDATA, an online information service, was begun to provide users with census information by telephone modems on their microcomputers. In the 1990s, census data was made available on CD-ROM and the Internet. In 1994, the Census Bureau was one of the first federal agencies to launch an Internet site.

Historically, the Census Bureau has experienced a gigantic change that has taken the agency from referring to summary tape files and providing massive volumes of paper, to

Figure 8.
Please List the Ways You Make Data Available to Your Data Users.
(Percent of repondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 6.

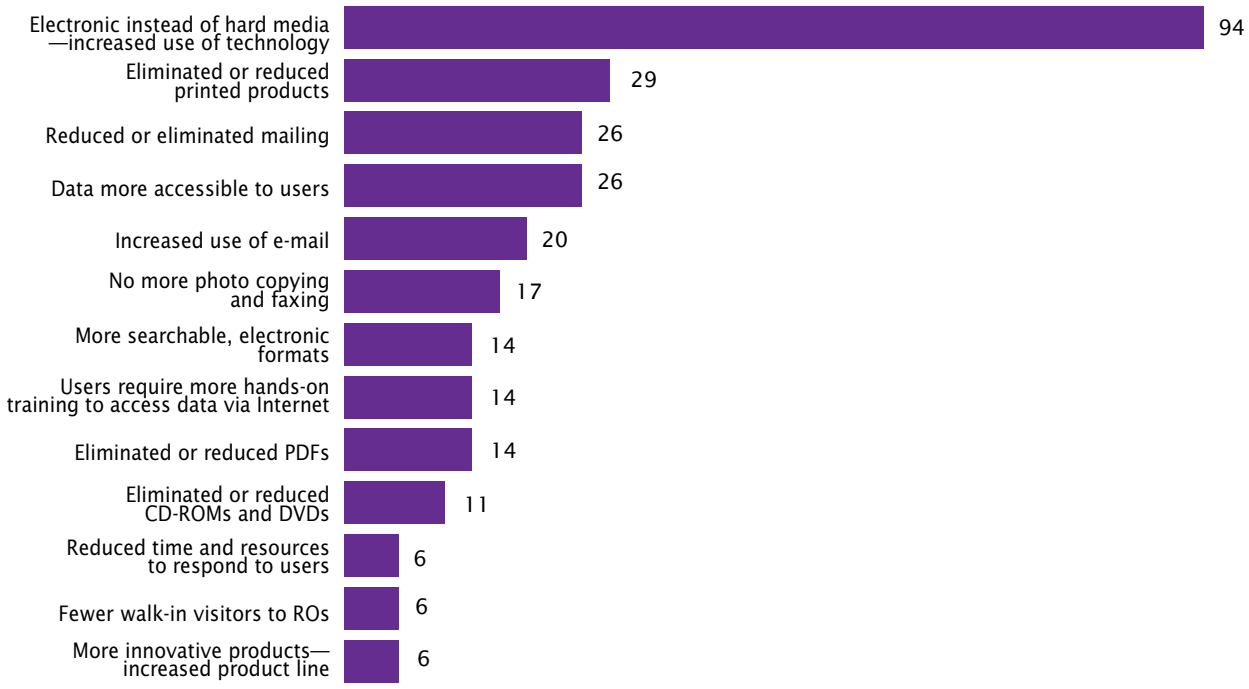
producing data that can be sent to users in nanoseconds. The amount of time and resources required in responding to and assisting data users has been diminished. Census Bureau staff now conduct virtual meetings or conference calls to discuss the most recent data releases or to conduct training. In other words, offices have eliminated formats that are no longer cost-effective to produce, which has freed resources to improve the accessibility of the data.

Ninety-four percent of Census Bureau divisions and offices said there has been an increase in electronic dissemination instead of hard copy. Twenty-six percent said the data are more accessible to data users, and 14 percent said there are more searchable formats available to data users. Twenty-nine percent said they have eliminated or reduced the use of printed products, and 26 percent have eliminated or reduced the need to mail or fax information to data users. Responses also show a reduction in the use of PDFs, CD-ROMs, DVDs, fax, photocopying, and mailings across the Census Bureau. These findings are shown in Figure 9.

The ROs reported fewer "walk-in" visitors. Only a small percentage reported a reduction in time and resources to respond to data users. At the same time, users require more hands-on training on how to access data via the Internet, specifically using the AFF. The New York Regional Office reported that, in the 1980s, data books and large maps were brought to presentations and workshops so attendees could learn, look up, and use information they needed or wanted for specific geographic areas. In the 1990s, they printed sections of the 4' x 4' maps to send data users in addition to data tables. Today users can print and download both thematic and reference maps from their computers. The regional offices and the Customer Liaison and Marketing Services Office Call Center staff also reported an increase in the amount of time used on the telephone to assist data users with the AFF.

The Census Bureau's Economic Programs Directorate reported that in response to feedback from their data users to the American Customer Satisfaction Survey and other Web site surveys, they have virtually eliminated printed reports, PDFs, CD-ROMs, and DVDs. They have been replaced with Web pages, Web tools, the Harvester

Figure 9.
How Has the Way You Make Data Available to Your Data Users Changed Over Time?
(Percent of respondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 7.

(Economic Indicators database), "Hot Reports," data visualizations, search engines, Notify Me announcements, GovDelivery's e-blast, data user conferences, online training, and Webinars.

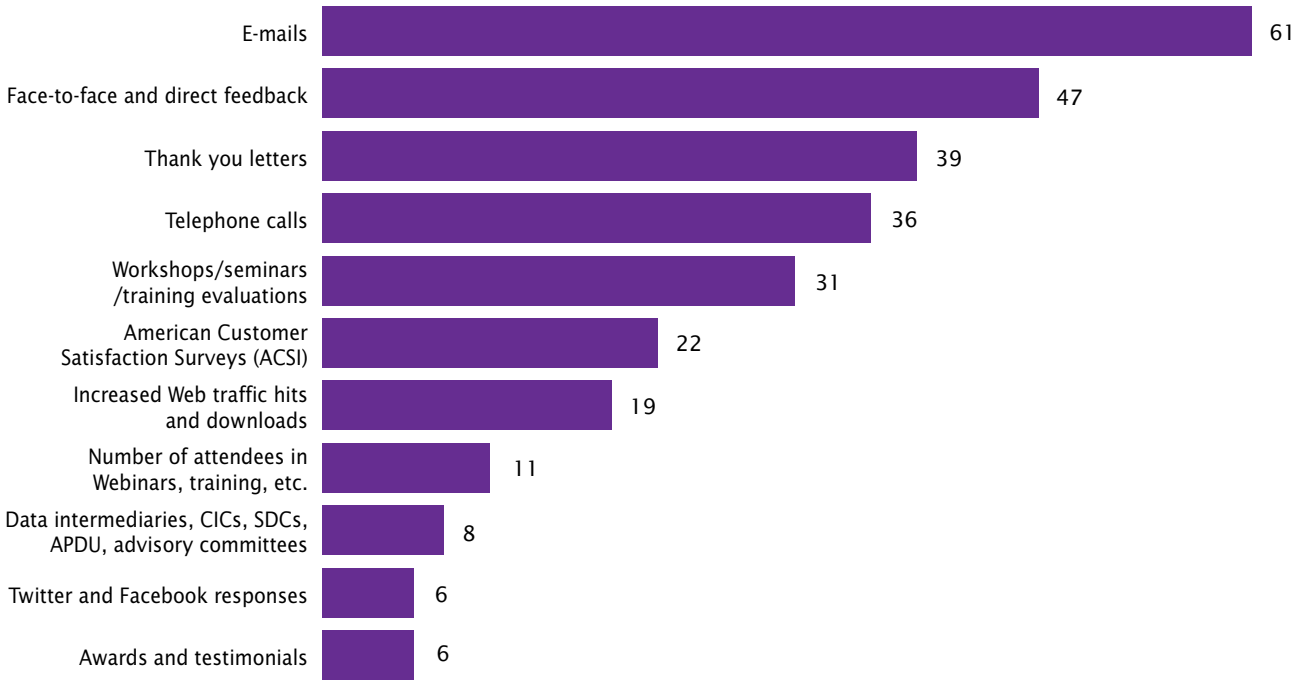
All of the other principal federal statistical agencies reported they use more Web-based dissemination and they have also reduced or eliminated printed products.

Figure 10 lists the feedback mechanisms used by Census Bureau divisions and offices to determine if their products and services are useful to their data users. Sixty-three percent reported using e-mail (user support e-mails embedded in their Web pages, AskCensus .gov, and personal e-mail "thank you" messages) to obtain feedback from data users on the usefulness of their products and services. Another 47 percent rely on face-to-face interactions and 39 percent use feedback from "thank you" letters from data users to gauge their level of satisfaction. Thirty-six percent rely on telephone feedback and 31 percent rely on evaluations from workshops, training, and seminars. Nineteen percent obtain data user feedback from Web analytics and 22 percent use the annual American Customer Satisfaction Survey. Other feedback mechanisms include: Twitter/Facebook followers and responses from data intermediaries and stakeholders, such as SDCs, CICs, advisory committees, the Association of Public Data Users, and the Population Association of America.

The ROs reported that exhibiting and attending conferences are additional ways of exposing the public to the various products produced by the Census Bureau. Many of these exhibits are followed up with telephone calls requesting information regarding classes and/or workshops for their respective organizations. According to one regional office, attendance at many of their workshops is at maximum capacity. This is a good indicator that data users find their workshops useful.

The top five feedback measures mentioned by the other principal federal statistical agencies were: (1) Web-based surveys (88 percent); (2) telephone and call center feedback (75 percent); (3) personal e-mail messages, user support e-mails, ask.gov e-mails (75 percent); (4) face-to-face at conferences and meetings (63 percent);

Figure 10.
Please List the Feedback or Measures You Receive That Show Your Data Users Find Your Data Products and Services Useful.
(Percent of respondents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 8.

(5) ongoing dialogue with stakeholders (63 percent); and (6) Web analytics (50 percent).

As mentioned in Figure 10, only 19 percent of Census Bureau divisions and offices use Web analytics and 22 percent use the American Customer Satisfaction Survey to obtain feedback from data users on the usefulness of their products and services. Most rely on e-mail, telephone calls, and face-to-face interactions with small groups of data users. This may be the reason why Census Bureau divisions and offices reported knowing less about their customers and why many have said their data users are "invisible." These findings are consistent with findings from the Web discovery interviews with Census Bureau staff members that found that staff have a good understanding of the expert users who communicated with them regularly through desk conversations and press events, but have far less understanding of casual and sophisticated (nontraditional and inexperienced) data users. As a result, the designs and language in Census Bureau data/products are generally suitable only for experts intimately familiar with the Census Bureau's structures and methods. Nonexpert users struggle to access, synthesize, or draw conclusions using Census Bureau data.[1]

Communities With Limited Internet Access to Census Data

When asked to identify the "hard-to-reach" (those with limited Internet access to census data), 63 percent of CICs and SDCs said that communities and individuals in rural areas have limited access to census data on the Internet. This included rural communities such as remote villages in Alaska, American Indian Reservations, Hawaii, and the Pacific Islands (Guam, American Samoa, Micronesia, Marshallese, and other independent islands like Palau). In some environments, Asians, minorities, and persons with low income and low educational attainment have limited Internet access to our data.

Thirty-seven percent said that new immigrants from Asian communities (such as Burmese, Bhutanese, and Nepali), ethnic enclaves, minorities, and communities of color have limited Internet access to our data. Others with limited access to our data via the Internet include: seniors/elderly, persons with disabilities, persons with limited English, undocumented persons, and persons living in multiple households.

According to a recent survey commissioned by the National Telecommunications and Information Administration (NTIA), over 30 percent of households and 35 percent of individuals do not use the Internet at home, and 30 percent of all persons do not use the Internet anywhere. The survey also found that those with no broadband access at home amount to more than 35 percent of all households and approximately 40 percent of all persons, with a larger proportion in rural areas in both categories. Overall, the two most important reasons given by the survey respondents for not having broadband access at home are "don't need" and "too expensive." Inadequate or no computer was also a major reason given for no home broadband adoption. In rural America, lack of availability is a much more important reason for nonadoption than in urban areas. The data also showed that virtually all demographic groups have increased their adoption of broadband services at home over time. Additionally, the report revealed that persons with high incomes, those who are younger, Asians and Whites, married couples, highly educated, and the employed tend to have higher rates of broadband use at home. Conversely, persons with low incomes, seniors, minorities, the less educated, nonfamily households, and the nonemployed tend to lag behind other groups in home broadband use.[2] These findings by the NTIA are consistent with what was reported by SDCs and CICs in the survey for this project.

In a recent study by the Pew Research Center, it was reported that in spite of the lack of home broadband Internet access by the groups referenced above, 6 in 10 Americans go online wirelessly using handheld devices such as cell phones. In fact the report goes on to say that nearly two-thirds of African Americans (64 percent) and Latinos (63 percent) are wireless Internet users.[3] According to findings from the investigation of Census.gov, the issue is no longer that minority communities lack Internet access to census data, but rather there are issues with Census .gov that directly affect the general public data user who comes to Census.gov with little content about the Census Bureau's work.

Barriers to Data Access

When asked to identify the barriers that prevent these communities from accessing census data, the SDCs and CICs said the following:

- Fifty-six percent said that the lack of ability to use AFF (the Census Bureau's primary data dissemination tool); lack of

[1] Abt Associates, "Emerging Trends and Best Practice: The Census Bureau and Web 2.0," p. 7, April 1, 2011.

[2] U.S. Department of Commerce, National Telecommunications and Information Administration.

[3] Smith, Aaron, Pew Research Center, "Mobile Access 2010," p. 6, July 7, 2010.

skills, awareness, and knowledge of census data; and a lack of training prevented communities from accessing census data on the Internet.

- Thirty-three percent and 22 percent said that the lack of Internet access and lack of high speed Internet access, respectively, prevented communities from accessing census data.
- Twenty-eight percent said that there is a lack of capacity (staff and funding) for organizations to train their staff and their communities on how to access and use census data.
- Other barriers mentioned were the lack of inclusion of data on emerging populations in census products, language barriers, fear of information from the federal government, low income and educational levels, and limited computer skills and equipment.

According to the Pew Research Center, Nielson, and others, groups traditionally identified as part of the "digital divide,"[1] no longer lack Internet access. They own cell phones and they use them to access the Internet on a daily basis.

When the SDCs and CICs were asked what methods they are using to address the barriers to data access by these communities, 58 percent said they provide training and workshops to local organizations on the AFF and help them understand how census data is used so they can help persons without Internet access. Twenty-six percent said they do outreach to organizations, Indian Reservations, and the younger population. They also handle data requests by telephone; prepare cultural- and ethnic-specific research data products; develop products that can be accessed using "slow speed" Internet access; provide printed materials; use social media; and use the ethnic media to help disseminate data.

The Web discovery investigation of the Census Bureau's Web properties identified a number of barriers to accessing census data via the Internet. Some of the findings include:

- The overall design of the Census Bureau's Web site targets expert data users. The Census.gov pages do not engage the casual and sophisticated (inexperienced, nontraditional) data user.
- Students, teachers, or ordinary residents looking for answers are confronted with a glut of information. An Internet search on topics such as population, poverty, homelessness, or housing, yields hundreds of possible resources and dozens of different formats.
- On the Census Bureau homepage, the central navigation mixes thematic pages like "poverty" with programmatic pages like the "American Community Survey." A casual user does not understand what the "American Community Survey" is but understands the title "Poverty."
- The Census.gov site does not have mapping tools and data visualization tools to help data users with limited knowledge of census data find the answers to their questions.

Ways and Means of Improving Data Access

Eighty-two percent of Census Bureau divisions and offices said they have taken steps to improve data access by hard-to-reach (HTR)[2] segments of the population. Their responses are shown in Figure 11.

There were some very distinct differences in how the Census ROs responded to this question compared to the Census Bureau divisions and offices. The ROs reported being more directly involved with the HTR community and the organizations that represent them. They use small meetings, workshops, training, personal visits, fax, and regular mail to disseminate data to the HTR community to a greater extent than Census Bureau headquarters offices. Census Bureau headquarters offices use a more indirect approach to working with the HTR community by developing user-friendly Web sites, Web tools, files, tables, Webinars, and relying on the ROs and stakeholders like the SDCs, CICs, and advisory committees. The Census Bureau's newly formed Center for New Media and Promotions reported using mobile friendly Web tools and cloud sourcing to reach data users.

Other ideas and suggestions offered by Census Bureau divisions and offices for improving access to census data by HTR communities included: making data more discoverable through Web search engines like Google; employing more "Cloud Sourcing" techniques; using social media to promote census data through postings and

[1] According to Wikipedia, the "digital divide" refers to the gap between individuals, households, businesses, and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communications technologies and to their use of the Internet for a wide variety of activities. It includes the imbalance both in physical access to technology and the resources and skills needed to effectively participate as a digital citizen. Knowledge divide reflects the access of various social groupings to information and knowledge, typically gender, income, race, and by location.

[2] A broad definition of hard-to-reach (HTR) refers to communities and populations without Internet access, without broadband Internet access, those with limited knowledge of Census Bureau data, and those without the skills and equipment to access census data on the Internet.

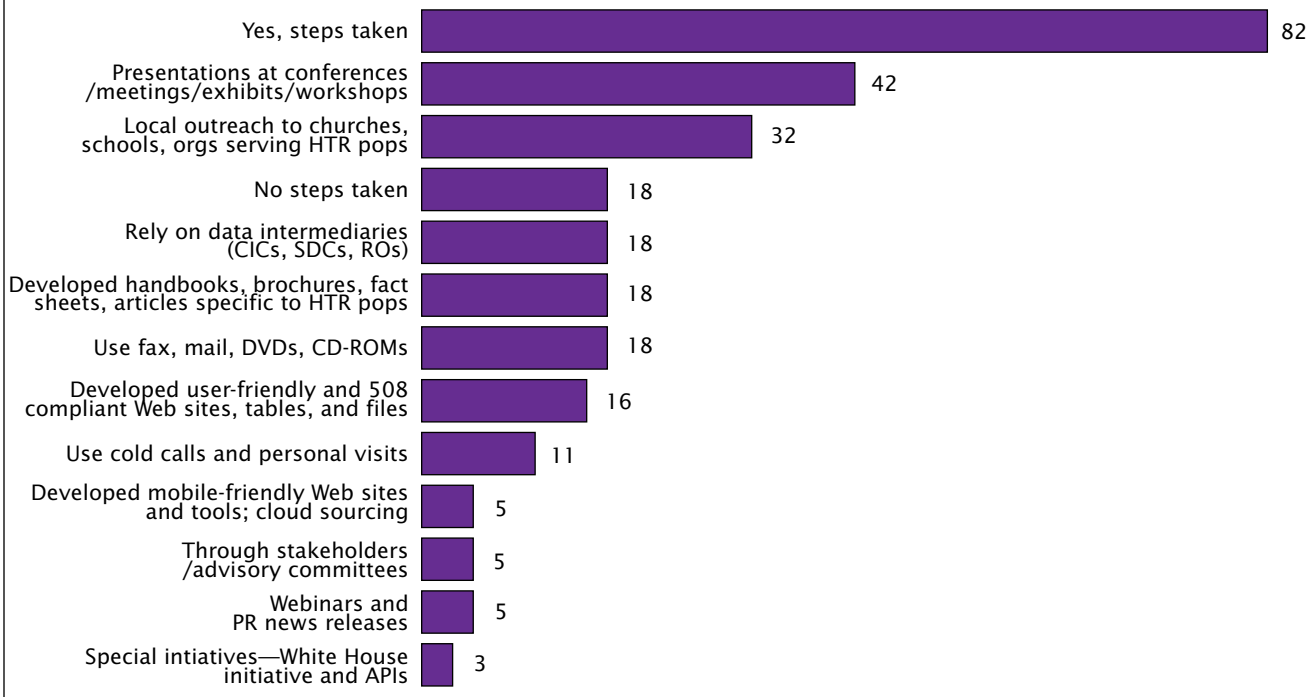
messaging; increasing outreach efforts and resources in the ROs to reach churches, schools, tribal governments, and minority media outlets; being more proactive by conducting more workshops and outreach to inform communities on census data; and expanding partnerships with data intermediaries, industry associations, chambers of commerce, the news media, and private sector.

When asked to list suggestions on how the Census Bureau can improve data access services to the hard-to-reach populations with limited Internet access and limited knowledge of data, 47 percent of SDCs and CICs said to partner with local communities, governments, tribal governments, the media, etc., to improve data access. Their other suggestions included:

- Provide funding to the SDCs and CICs to train local communities.
- Increase printed reports.
- Conduct in-language training and culturally appropriate Webinars.
- Reduce content on our Web site that slow reception for "low speed" access users.
- Maintain and expand the Census Information Center Program and the Advisory Committees.
- Develop a stratified approach to data dissemination such as traditional and high tech and east coast and west coast.
- Identify and publish the locations where persons without Internet access can find census data, such as in Census Depository Libraries, State Data Centers and Census Information Centers.
- Recruit and hire more language and culturally sensitive staff.

The California Complete Count Committee (California State Data Center) suggested that the Census Bureau create a data dissemination tool similar to the Healthy City 2010 Census Web site functionalities that allowed local communities in the state of California to map and analyze data from the Census Bureau's hard to count scores and integrate them with demographic data from Claritas, Inc. The Healthy

Figure 11.
Has Your Division or Office Taken Steps to Improve Data Access by Populations and Communities Without Internet Access? Please Describe.
(Percent of respodents)



Note: Respondents include 38 of 40 divisions/offices that work with data users at the Census Bureau.
Source: U.S. Census Bureau, *Historical Analysis of Data User Services and Data Users Survey*, Questionnaire 1, question 9.

City Web site allowed users to create custom neighborhood boundaries and to identify geographic "hot spots" in which to analyze their own response rate datasets to more effectively plan canvassing, media outreach, and training activities. They further stated that data dissemination is very important and should continue to be part of an overall strategy of the Census Bureau. This strategy, however, needs to be shared with partners early in the process (starting in 2012 or as early as possible) so that census partners can build their strategies to align with the Census Bureau.

Sixty-three percent of the other principal federal statistical agencies as a whole said they have no specific programs targeted at improving data access to hard-to-reach populations. However, the following are some of the individual actions they are taking: ensuring that their Web site data is 508 compliant; continuing to print, warehouse, download, fax, and mail information to customers who do not have Internet access; using direct marketing and mailing products to libraries, land grant colleges, and rural organizations; providing a distance learning program with land grant colleges, tribal colleges, and Hispanic-serving colleges and universities; providing granting programs to assist tribal governments and other minorities by providing equipment, workshops, training, and technical assistance; publishing reports in Spanish; and creating a new position in their Office of Outreach and Diversity to work with underserved customers.

There were a number of recommendations and ideas from the Census Bureau Web discovery investigation that may potentially improve census data access by communities and groups that do not have broadband Internet access, but are using wireless access on their mobile devices such as cell phones and laptops. Some of the suggestions and ideas include:

- Help people connect with mobile strategies. The Census Bureau should conduct a user study to determine how customers use or would like to use the Census Bureau's tools on smartphones and tablets.
- Help people explore data by standardizing formats in which similar data are displayed across the Census Bureau; provide interactive mapping and graphs in more reports, blogs, and press releases.
- Provide data in formats that are readily found and comprehended like "Quickfacts" and "Population Finder."
- Pare down unused materials that may distract users from more relevant material.
- Create a visual site map for end users to replace the "Subjects A to Z" site map. Casual users visit the site with little understanding of the Census Bureau's organizational structure or the specific information about the products it provides.

In this chapter, we defined the major categories representing the Census Bureau's "typical" data users; provided current information on how we disseminate data to them; and identified ways to improve future data dissemination efforts to communities and groups who have limited Internet access and limited knowledge of Census Bureau data.

CHAPTER 3.
CONCLUSIONS, CHALLENGES, AND RECOMMENDATIONS

Throughout this report we have shown that the principal statistical agencies across the federal government, including the Census Bureau, have moved nearly all of their data products to the Internet. While the Census Bureau has been at the forefront of technological advancement throughout the twentieth century, it must remain vigilant in anticipating its customers' needs and abilities. This project was designed to examine how Census Bureau offices and other federal statistical offices perceive their data users, their abilities, and how they access data products.

When considering how data users have changed because of the advent of the Internet, it is important to first consider exactly who these users are. Recall that Figure 3 shows that the largest definition of data users was rather generic: "anyone who uses data." Digging deeper into the results gives some resolution. We found that most Census Bureau and statistical agency offices define their users along three major dimensions: direct or indirect users, passive or active users, and experienced or inexperienced. Furthermore, we found that most offices thought about their users in terms of why they used the data—be it for research, curiosity, or policy making. One of the largest differences between the Census Bureau offices and the external statistical agencies was that the other agencies considered Congress to be more of a common user than did most Census Bureau offices. Furthermore, within the Census Bureau organization, ROs had more "micro" users than did headquarters offices—as in individual users and local governments—and likewise reported less contact with other federal government agencies and offices. This difference in scope is important.

One of the purposes of this study was to identify who the Census Bureau's "typical" data users are and how they have changed over time. Our findings show that the Census Bureau's major data user groups have not changed in decades. However, because of the Internet, the number of casual, inexperienced, and nontraditional data users has expanded and we know less about them; our expert, traditional, experienced data users have more complex data requests; and both are requiring more time and resources for Census Bureau staff to respond to their needs.

We also found that the Census Bureau's "typical" data users are represented in the following 10 major groups:

- Federal government agencies
- State and local government agencies
- Businesses
- Academic institutions
- National/regional/local organizations
- Trade and professional associations
- Media
- Researchers
- Individuals
- Congress

Our findings show that Census Bureau divisions and offices are faced with a number of challenges to effectively serve census data users. Table 2 lists the major challenges from this study and provides recommendations and possible solutions from the Web discovery process, from Census Bureau divisions and offices, and from participants in the CIC and SDC programs.

Finally, the Census Bureau has had a long and challenging history from the first posting of census results in the town squares across the country to disseminating data through the Internet. Today, the Internet has truly revolutionized the way we disseminate data and provide services to our data users. There has been an increase in the use of Webinars for training and education; the use of new technology such as GovDelivery to send large e-blasts to thousands of data users as part of our external engagement efforts; a proliferation in data access and data extraction tools, such as the AFF, DataFerrett, and the Local Employment Dynamic's OnTheMap application; and the use of social media tools like Twitter, Facebook, YouTube, and RSS feeds. The agency is already embarking on mobile access strategies to help data users connect using mobile devices such as iPads and smartphones and developing products and services for this group of data users. We are working on strategies to replace the desktop PC and allow staff to access their desktops remotely. We are considering Pads and other mobile devices to replace the laptops for our 5,000 field representatives and using Skype sessions or Facetime meetings to create an easy video teleconference with data users.

Table 2.
Challenges and Recommendations

Challenge	Recommendation
Census Bureau divisions and offices have experienced an increase in the number of casual, nontraditional, inexperienced data users who are unfamiliar with how to access and use census data thus requiring more time and resources to assist them. Census data users have difficulty finding the information they need from the Census Bureau's Web site and the American FactFinder (AFF). The Census Bureau's regional office staff and headquarters staff are spending a lot of time on the telephone assisting data users with the AFF.	1. Redesign the Census Bureau's homepage to engage all audiences, but especially the nonexpert user. More specifically, provide a visual site map organized by intuitive topics to help the casual user find answers. 2. Design topic or theme pages (e.g., Poverty) that engage the nonexpert users. 3. Give the casual user prepared data views, data discovery and visualization tools such as a map of the United States where they can click on a state and get their population.
Census data users have become "invisible" and we know less about them because of the Internet. We no longer capture their customer information because of privacy concerns, and there are fewer walk-in visitors to the Census Bureau's regional office data centers. Census data users are defined as anyone who uses census data. Staff must serve users with little or no knowledge of census data (casual, nontraditional, inexperienced users) to the more expert users (traditional, experienced, expert users).	Develop ongoing relationships with customers/data users. Best practice in Web site development is predicated on a clear understanding of the customers' needs, interest, and skills. The most effective way to build that understanding is through interactions. Census Bureau leaders should develop plans for engaging customers at each stage of the Census.gov redesign. Some of the activities can include: 1. Online discussions through blogs, town hall events, or page comments 2. Focus groups, surveys, and interviews 3. User groups (e.g., 5-year ACS data users) 4. Analysis of social media metrics The Census Bureau should analyze their customers. Using a range of techniques such as surveys, user feedback, analysis of customer logs, interviews, focus groups, stakeholder meetings and other approaches to develop as full as possible an understanding of the characteristics of its current and potential customers. Future dissemination and customer support services should be planned around the needs of each major segment.
Experienced, expert census data users' questions are more complex requiring the use of data across multiple datasets.	Enable sophisticated and expert users (experienced and traditional users) to access Census Bureau data in a manner in which they use the data, not in a manner in which the Census Bureau collects and organizes it, through the use of API or better data extraction tools.
Census Bureau divisions and offices rely on e-mail messages and telephone calls to obtain feedback from data users on whether their products and services are useful. Most are not using Web analytics or usability testing before offering products and services to data users.	Expand user experience design and usability testing. Census Bureau leaders should institutionalize user experience design by requiring it in all internal and external proposals for online tools. Census Bureau public-facing products should all go through usability testing leveraging the existing Census Bureau usability lab. Results from the usability tests and the ForeSee results should be enforced.
A lack of high-speed Internet access prevents certain communities and populations from accessing census data. However, more and more of Americans are using mobile computing devices to access the Internet, especially African Americans and Latinos.	1. Help people connect with mobile strategies. Enhance the mobile browsing experience developing dedicated mobile pages with simplified navigation. 2. Use Web 2.0 strategies to engage customers in two-way conversations and integrate their material into a flowing online interaction. Shaping materials for diverse communication/distribution channels (e.g., mobile phones, Facebook, etc.) and interactive experiences (e.g., dynamic mapping) requires a revolution in the underlying business processes that produce these kinds of information tools. 3. Reduce content on our Web site that slow reception for "low speed" access users.
Organizations lack the resources to train and educate their staff on census data and how to access the information.	1. Continue partnership efforts with local communities and state, local, and tribal governments, etc. Use the regional office (RO) partnership staff, the SDCs, and CICs to assist in training local groups on how to access and use census data. 2. Publish the locations where local communities can go to get assistance, such as Census Depository Libraries, SDCs, CICs, and ROs. 3. Conduct more in-language and culturally sensitive training and Webinars.

APPENDIX A.
REFERENCES

Abt Associates, Inc, "Emerging Trends and Best Practice: The Census Bureau and Web 2.0," April 1, 2011.

Abt Associates, Inc, PowerPoint Presentation, "Expert Review of Census.gov," April 27, 2011.

"Among Mobile Phone Users, Hispanics, Asians are Most-Likely Smartphone Owners in the U.S.," <http://blog.nielsen.com/nielsenwire/consumer/among-mobile-phone-users-hispanics-asians-are-most-likely-smartphone-owners-in-the-u-s/>, Nielsen wire, February 1, 2011.

Anderson, Margo J., Encyclopedia of the U.S Census, Congressional Quarterly, Washington, D.C., 2000.

Barabba, Vincent P., "Organization and Staff Changes," memo, July 2, 1974.

Barabba, Vincent P., "User Service Activity Coordination," memo, August 5, 1975.

Benton, O. Bryant, "Revision of the Bureau of the Census Organization Manual," memo, October 23, 1980.

Beresford, J. C., "The Role of the Census in Providing Data Access Services," U.S. Census Bureau, 1968.

Bernard, Russell H., *Research Methods in Anthropology*, Fourth Edition, 2006.

Brown, George H., "Bureau Organization Realignments and Staff Assignment," memo, August 20, 1971.

Brown, George H., "Departmental and Census Reorganization," memo, December, 14, 1971.

Capps, Cavan, PowerPoint Presentation, "The DataWeb: a Framework for Accessing and Using Data," December 23, 2010.

Chapman, Bruce, "Organization Announcement," memo, April 18, 1983.

Chenail, Ronald J., "Presenting Qualitative Data," The Qualitative Report, Volume 2, Number 3, December, 1995.

Dickinson, Joanne C., "Survey of Census Bureau Internet Users, Final Report, December 1996."

Dickinson, Joanne C., "Survey of Census Bureau Web Site Customers," February 1998.

Dickinson, Joanne C., "Eternal Customer Satisfaction Survey," 2008

Dickinson, Joanne C., "Executive Summary, November and December 2000," Executive, October 2001.

Dickinson, Joanne C., "Survey of Visitors to the Census Bureau's Web Site," January 2003.

Dickinson, Joanne C., "Survey of Visitors to the Census Bureau's Web Site," January 2004.

Dickinson, Joanne C., Joni Richman Thompson, and Rebecca Vilky, "2004 Survey of Visitors to the Census Bureau's Web Site," May 23, 2005.

Dickinson, J. C., "Survey of Census Bureau Web Site Customers," U.S. Census Bureau, 1997, 2000–2008.

"Digital Divide in the United States, <http://www.earlham.edu/beckmst/DigitalDivide/DigitalDivideUS.html>, December 7, 2010.

Drake, M. A., "The U.S. Census Bureau in the 21st Century," *Information Today*, Inc., Vol. 10, No. 6, 2002.

DUAL-Comm, Inc., "The Role of the Census in Providing Data Access Services," September 1968.

Gahran, Amy, "Hispanics lead U.S. embrace of mobile technology," PEW Internet, Pew Research Center <http://www.pewinternet.org/Media-Mentions/2011/Hispanics-lead-US-embrace-of-mobile-technology.aspx>, May 20, 2011.

Garland, Michael G., memo to O. Bryant Benton, "Reorganization of the Data User Services Division," August 9, 1977.

Garland, Michael G., memo to M. Douglas Fahey, "Organization and Title Changes," April 7, 1975.

Garland, Michael G., "Census Bureau Announces New Program of Data Centers for States," United States Department of Commerce News, September 12, 1978.

Garland, Michael G., memo to O. Bryant Benton, "Request for Organizational Change and Updating of the Narratives on the Division's Official Organization Chart," December 22, 1978.

Garland, Michael G., memo to O. Bryant Benton, "Request for Organization Changes," December 8, 1980.

Garland, Michael G., "A Short History of DUSD (and its roots)," September 17, 1985.

Goldfield, Edwin D., "Studies Made of Uses of Census Bureau Statistics and Materials for Studies," memo, August 5, 1963.

Goldfield, Edwin D., memo to John Baker, "Background on Studies of Uses," memo, June 25, 1963.

Goldfield, Edwin D., Task Force on Uses of Census Statistics, meeting minutes, July 3, 1963.

Goldfield, Edwin D., memo to John Baker, "Guidance on Studies from the Census Advisory Committee of the American Statistical Association," July 5, 1963.

Goldfield, Edwin D., Task Force on Uses of Census Statistics, meeting minutes, July 24, 1963.

Goldfield, Edwin D., Task Force on Uses of Census Statistics, meeting minutes, August 7, 1963.

Goldfield, Edwin D., Task Force on Uses of Census Statistics, meeting minutes, August 29, 1963.

Goldfield, Edwin D., memo to John Baker, "Interim Report of the Task Force on Uses of Census Statistics," September 20, 1963.

Goldfield, Edwin D., Task Force on Uses of Census Statistics, meeting minutes, September 25, 1963.

Goldfield, Edwin D., memo to Richard M. Scammon, "Interim Report of the Task Force on Uses of Census Statistics," September 30, 1963.

Goldfield, Edwin D., Task Force on Uses of Census Statistics, meeting minutes, November 13, 1963.

Goldfield, Edwin D., letter addressed to A. Ross Eckler, July 16, 1965.

Goldfield, Edwin D., "Study of Uses of Census Bureau Statistics," Draft, January 10, 1974.

Gutierrez, G., "Analysis and Recommendations: U.S. Census Bureau, Customer Communication and Data Dissemination," U.S. Census Bureau, 2003.

Hovland, M. A., and J. G. Gauthier, "History of the 1997 Economic Census," U.S. Census Bureau, 2000.

Hovland, M. A., and J. G. Gauthier, "Procedural History of the 2002 Economic Census," U.S. Census Bureau, 2006.

Jansen, J., "Use of the Internet in Higher Income Households," Pew Research Center, 2010.

Jarmin, Ron S. (2010): "2009 Research Report: Center for Economic Studies and Research Data Centers," U.S. Census Bureau.

Kallek, Shirley, memo to Maxwell R. Conklin, "Proposal for the Establishment of an Economic Census Data User Workshop," June 19, 1968.

Kang, Cecilia and Krissah Thompson, Washington Post, Washington Business Section, column 1, "Hispanics on Web Less than Others," February 23, 2011.

Lerner, William, memo to Edwin D. Goldfield, "Uses of Census Statistics as Reflected in Comments at National Merchants Convention," January 16, 1964.

Levine, Daniel, "Organization Announcement," memo, June 21, 1979.

Marks, Eli S., "Proposal for Study of Utility of Census Data," November 25, 1961.

Neuendorf, Kimberly A.,"A Flowchart for the Typical Process of Content Analysis Research," The Content Analysis Guidebook, <http: //www. academic.csuohio.edu/kneuendorf/content/>, October 9, 2006.

Nolting, Orin F., letter to Richard M. Scammon, "Supporting Federal Government Statistical Programs," November 5, 1964.

Office of Management and Budget, "Statistical Programs of the United States Government: Fiscal Year 2011," 2011.

O'Neil, Samatha, "Web Discovery Study Plan," 2010.

Paez, A. L., "U.S. Census Data Uses," *Statistical Journal of the United Nations Economic Commission for Europe*, ECE 9, pp. 325–337, 1992.

Plotin, Manuel D., "Organization Announcement," memo, March 1, 1978.

Plotin , Manuel D., memo to Michael G. Garland, "Coordination of Information Systems Activities," May 9, 1978.

Rainie, L., "Internet, Broadband, and Cell Phone Statistics," Pew Research Center, 2010.

Roane, Kit R., "Facebook: Where Marketing Efforts Go to Die," CNNMoney.com, April 6, 2010.

Ross, Eckler, A., Small area statistics, memo, October 30, 1964.

Ruggles, Richard, letter to Vincent P. Barabba, "General Areas of Interest in Economic and Social Measurement," November 19, 1973.

Sandelowski, Margarete, "Writing A Good Read: Strategies for Re-Presenting Qualitative Data," Research in Nursing & Health, 1998, 21, p.375–382.

Scammon, Richard M., letter to Arthur Sanford, January 22, 1964.

Scammon, Richard M., memo to John Baker, "Task Force on Uses of Census Statistics," June 18, 1963.

Smith, A., "Government Online: The Internet Gives Citizens New Paths to Government Services and Information," Pew Research Center, 2010.

Smith, Aaron, "Mobile Access 2010," Pew Research Center, 2010.

Smith, Gabriela, "Department of Commerce-Census Bureau Satisfaction Insight Review," October 2010.

"The Birth of DIME," The Association For GIS Professionals, June 1977, column 1, p. 9.

"Tips for Analyzing Qualitative Data," <http://www.insites.org/CLIP_v1_site/downloads/PDFs /TipsAnalzQualData.5D.8-07.pdf>, May 2007.

Turner, M. L., Jr. (1998): "Developing a User Support Program: 1965–1990 in the United States," U.S. Census Bureau.

Turner, M. L., Jr., and F. G. Bohme, "The National Census: The Parts Are Greater Than the Whole," U.S. Census Bureau, 1992.

Turner, Marshall L., Jr. and Robert A. LaMacchia," The U.S. Census, Redistricting, and Technology," Social Science Computer Review, volume 17, No.1, Spring 1999, pp.16-26.

United Nations, "Making Data Meaningful, Part 2: A guide to presenting statistics," Geneva, 2009.

U.S. Census Bureau, 2010 Census Planning Memoranda Series, No. 14, p. 6, June 2003.

U.S. Census Bureau, "Director Plotin is Confirmed," Census Bulletin, Vol.XXVII, column 1, May 1977 p. 1.

U.S. Census Bureau, "DUSD Answers Needs for Guides to Census," Census Bulletin, Vol. XXVII, column 1, May 1977, p. 4.

U.S. Census Bureau, "Extracts and Non-Census 2000 Special Tabulations," December 02, 2010.

U.S. Census Bureau, "History: 2000 Census of Population and Housing, Chapter 4, Partnership and Marketing, p. 207, December 2009.

U.S. Census Bureau, "History and Organization," FactFinder for the Nation, 2000.

U.S. Census Bureau, "LED: Data Visualization Plan," August 5, 2010.

U.S. Census Bureau, Special Tabulations: 2000-Monthly Report, December 02, 2010.

U.S. Census Bureau, "The Census Bureau and Web 2.0, PowerPoint Presentation, "Emerging Trends and Best Practice," April 27, 2011.

U.S. Census Bureau, "*The Story of the Census: 1790–1916*."

U.S. Census Bureau, Web Discovery: "Data Visualization and the Future of Census.gov," August 23, 2010.

U.S. Census Bureau, Web Discovery: Request for Proposal, R&D 2014 Contracts, "Describing the Census Bureau's New Data Users: Request for Proposal, R&D 2014 Contracts, Who may benefit from our data? How much? What is the best way for us to provide it to them?"

U.S. Census Bureau, Web Discovery: Request for Proposal, R&D 2014 Contracts, "Census in Schools and Partnership Research."

U.S. Department of Commerce, "Better Use of Government Data By Business Aim Of New Survey," Commerce Today, column 1, May 27, 1974.

U.S. Department of Commerce, "Digital Nation: 21st Century America's Progress Toward Universal Broadband Internet Access," National Telecommunications Information Administration, 2010.

U.S. Department of Commerce, "Exploring the Digital Nation: Home Broadband Internet Adoption in the United States," National Telecommunications Information Administration, 2010.

Vilky, Rebecca, "Annual Survey of Visitors to the Census Bureau Web Site 2006 Final Report," April 3, 2007.

Voight, Robert B., "Report on Plains for the Study of the Use of Census Bureau Statistics," memo, October 16, 1964.

Voight, Robert B. ,"Survey of Request for Census Data Received by Census Regional Offices during the six months period, October 1964 through March 165," memo, November 16, 1965.

Voight, Robert B. memo to Edwin D. Goldfield, "Samples of Requests for Census Data Received by DUSD." January 2, 1974.

Wallace, Mark and Robert Marske, "Census Bureau Improves Access to Economic Indicators," December 2010.

Weintraub, Seth, "The Numbers Don't Lie: Mobile Devices Overtaking PCs," <http://tech.fortune.cnn.com/2010/08/11/the-great-game-mobile-devices-overtaking-pcs/>, CNNMoney.com, August 11, 2010.

APPENDIX B.
QUESTIONNAIRES

Questionnaire 1:
(Same form was used for Census Bureau divisions and offices, and the other principal federal statistical agencies.)

A Historical Analysis of Data User Services and Data Users of the Census Bureau

Project Description

The purpose of this project is to conduct an in-depth study and detailed historical analysis of how the Census Bureau has provided data user services, how it has typically defined a "data user," and the ways and means the Census Bureau could improve on those efforts, especially with hard to reach communities of color, rural communities, and communities with less than average access to the Internet and the World Wide Web.

In order to serve our customers well, the information from this project will provide baseline data for a larger research effort to help understand who the new users of census data will be, their data needs, and their technical capabilities.

The process will involve collecting historical and current information from the following Census Bureau divisions and offices: HHES, POP, DADSO, ACSO, FLD, GEO, EPCD, GOV, SSSD, CSD, MCD, FTD, History staff, and the Census Library; collecting similar information from the other 14 principal federal statistical agencies on who their data users are, how do they know if the services and content of what they are providing is helpful to their data users, and what mechanisms do they use to obtain feedback; and finally, conducting a survey of the State Data Center and Census Information Center Program participants to seek input on ways and means to improve data access too hard to reach communities.

Due Date

Responses to the questionnaire are requested by January 31, 2011. If more time is needed, please contact Barbara Harris on 301-763-6678 or <barbara.a.harris@census.gov>.

Research Questions

Please provide detailed information to the following questions:

1. In your own words, what is a data user? (How would you define what a data user is?)
2. Who are your typical data consumers (for example: academic researchers, students, journalists, businesses, Congress, legislatures, government agencies, organizations, etc.)?
3. How do you know who your typical data consumers are? What kinds of contacts have you had with them? (For example: do they call you on the phone, send e-mails, attend classes, order products, serve on oversight committees, etc.?)
4. Historically, who have your data consumers been? If it has changed, how?
5. Has the availability of data over the Internet changed how your office defines a "data user"/"data consumer?" How?
6. Please list the ways you make data available for your consumers.
7. How has this changed over time?
8. Please list the feedback or measures you receive that show your data consumers find your data products and services useful.
9. Has your division or office taken any steps to improve data access for hard-to-reach segments of the population, including minorities, rural communities, or those without Internet access? If yes, please describe.

Questionnaire 2:

Project Description

The Census Bureau is conducting an in-depth study and detailed historical analysis of its data user services and data users, and identifying ways to improve on those efforts, especially for hard-to-reach communities of color, rural communities, and communities with less than average access to the Internet and the World Wide Web.

Due Date

Your responses to the following questions are important and will help us improve our services to our data users. Please respond by March 3, 2011.

Research Questions

1. What is the name of your organization or state?
2. Thinking of all your customers, are there any hard to reach data users[1] that you are aware of? Yes/No
3. If yes, who do you believe is currently hard to reach?
4. What are the barriers that limit data access for these groups?
5. If you currently employ any special methods to reach these groups, please explain.

Please list any suggestions you may have for improving data dissemination for hard-to-reach populations.

[1] Underserved populations include rural communities, communities of color, and communities with less than average access to the Internet and the World Wide Web.