

History

Issued December 2009

2000 Census of Population and Housing

PHC-R-V1

Volume 1

Chapter 1: The Context of Census 2000

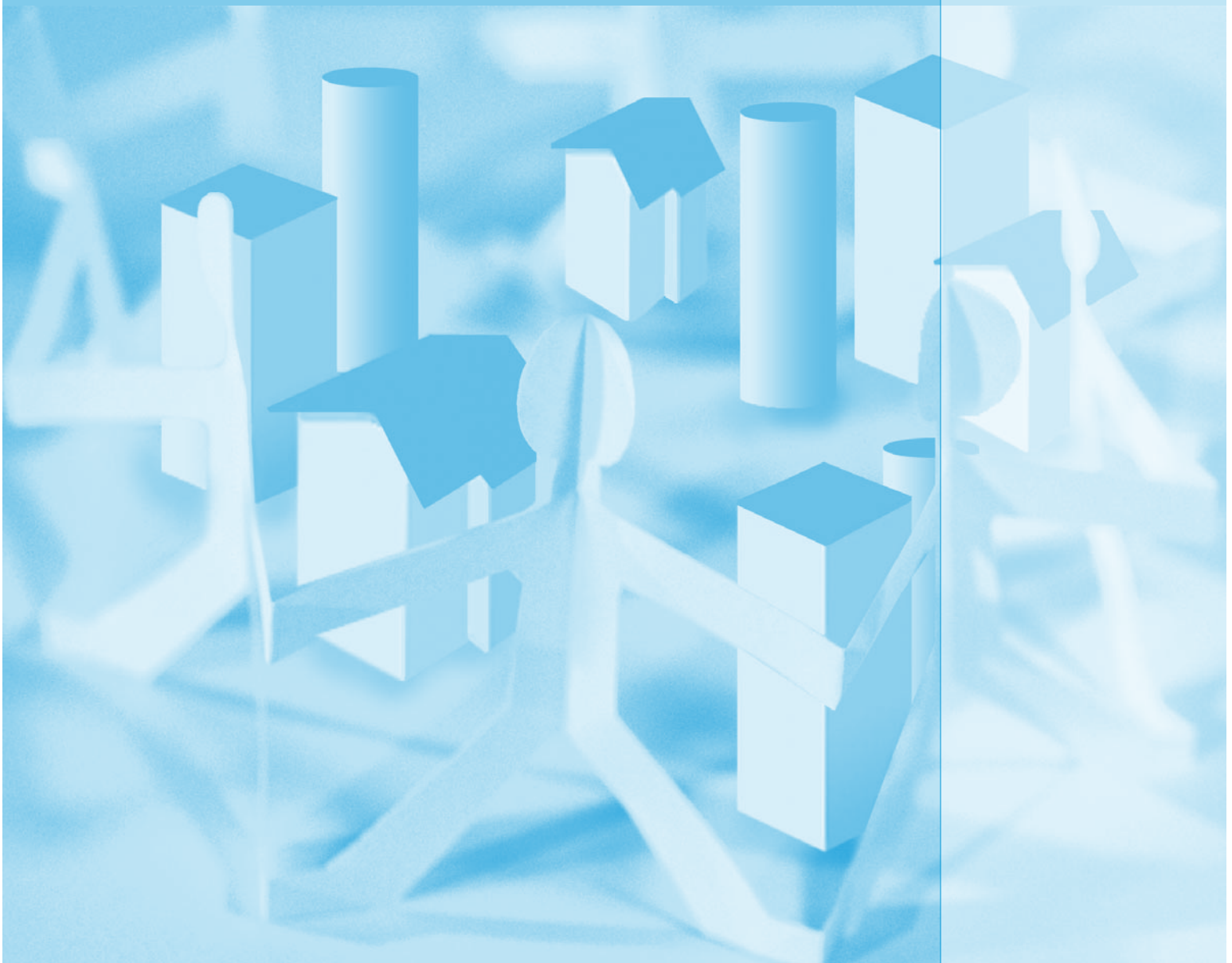
Chapter 2: Planning the Census

Chapter 3: Population and Housing Questions

Chapter 4: The Partnership and Marketing Program

Chapter 5: Data Collection

Chapter 6: Data Capture and Processing



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Volume 1: Preface

This volume includes the six chapters that constitute the first half of the *History: 2000 Census of Population and Housing*. These chapters present detailed descriptions of many aspects of Census 2000, including the early stages of research and planning, questionnaire development, advertising and outreach, and data collection and processing.

Chapter 1, “The Context of Census 2000,” contains summary population totals for the United States, Puerto Rico, and the Island Areas and for major race groups and an overview of the political, statistical, and technological context in which the census took place. **Chapter 2, “Planning the Census,”** describes preparations for the census, including lessons learned from the 1990 census, consultations with governmental and other data users, recommendations from the National Academy of Sciences and other advisory groups, and the plans for and results of census tests conducted between 1992 and 1998. **Chapter 3, “Population and Housing Questions,”** summarizes the history of each question on the short and long forms, the response categories, data uses, and any associated editing, allocation, and coding instructions. **Chapter 4, “The Partnership and Marketing Program,”** reviews evaluations and recommendations from the 1990 program, the decision to use paid advertising in Census 2000, developing and implementing an integrated marketing strategy, components of the partnership program, and a series of special initiatives. **Chapter 5, “Data Collection,”** describes the organization and distribution of regional census centers and local census offices, the hiring and training of temporary field staff, the hardware and software used to track and assess census progress, and the different components of the enumeration process. **Chapter 6, “Data Capture and Processing,”** summarizes the decision to hire contractors to conduct data capture and manage the data capture centers, the hardware and software used to capture census data, the headquarters tabulation process, identification and deletion of duplicates, editing and imputation, intermediate data files, and the creation of the 100 percent and sample detail files.

Volume 2 of this *History: 2000 Census of Population and Housing* covers such topics as data collection and tabulation geography, mapping, creating and updating the census address list, data products and their dissemination, the experimental and evaluation programs, legislation, litigation, the debate over sampling, and the census in Puerto Rico and the Island Areas.

Volumes and Chapter Titles of the *History: 2000 Census of Population and Housing*

■ Volume 1

Chapter 1: The Context of Census 2000 *p. 3*
Chapter 2: Planning the Census *p. 27*
Chapter 3: Population and Housing Questions *p. 99*
Chapter 4: The Partnership and Marketing Program *p. 173*
Chapter 5: Data Collection *p. 215*
Chapter 6: Data Capture and Processing *p. 273*
Appendix A: Major Events in the Planning and Conduct of Census 2000 *p. A-1*
Appendix B: Census 2000 Regional Census Centers and Local Census Offices by
Regional Census Center Code Number *p. B-1*
Appendix C: Census 2000 Full Cycle Obligations, Budget Authority, and Appropriations *p. C-1*
Appendix D: Census 2000 Short (100 Percent) Form *p. D-1*
Appendix E: Census 2000 Long (Sample) Form *p. E-1*
Glossary

■ Volume 2

Chapter 7: Census Geography and the Geographic Support System *p. 317*
Chapter 8: Addresses and Questionnaire Printing and Mailing *p. 351*
Chapter 9: Data Products and Dissemination *p. 399*
Chapter 10: Testing, Experimentation, Evaluation, and Coverage Measurement
Programs *p. 447*
Chapter 11: Legal Issues *p. 517*
Chapter 12: Puerto Rico and the Island Areas *p. 595*
Appendix F: Overview of Congressional Hearings on Census 2000 Issues Held
by Oversight Committees and Subcommittees *p. F-1*
Appendix G: American Samoa Census Form *p. G-1*
Appendix H: Commonwealth of the Northern Mariana Islands Census Form *p. H-1*
Appendix I: Guam Census Form *p. I-1*
Appendix J: U.S. Virgin Islands Census Form *p. J-1*
Appendix K: Puerto Rico Census Form *p. K-1*
Glossary



Census Day, 2000

By the President of the United States of America

A Proclamation

Every 10 years, as mandated by our Constitution, all persons living in the United States are called upon to participate in the census. As the foremost method of gathering information about our Nation, the census plays a crucial role in helping us to maintain our democratic form of government.

An accurate census helps to ensure that the rights and needs of every person are recorded and recognized as we shape public policies, programs, and services. Too often in the past, children, minorities, and low-income individuals have not been counted and, as a result, have not been fully and fairly served. Census data are also used to determine the number of seats each State is allocated in the U.S. House of Representatives, and State and local governments depend upon these data to draw legislative districts that accurately represent their residents.

The census also serves as the basis for many public funding and private investment decisions. Census results play a part in determining the portion each State receives of more than \$185 billion in funds distributed by the Federal Government each year. State and local public officials use census data to decide where to build public facilities such as schools, roads, hospitals, and libraries. Census data also are a valuable resource for businesses that are trying to identify where to build stores, office buildings, or shopping centers.

The census is unique. It reaches every population group, from America's long-time residents to its most recent immigrants, and every age group from newborns to centenarians. The census touches every social class and every racial and ethnic group. The census is truly a democratic process in which we all can participate.

Census 2000 offers each of us an important opportunity to shape the future of our Nation. By taking part, we help ensure the well-being of our families and our communities, and we fulfill one of our fundamental civic duties. The U.S. Census Bureau has taken unprecedented steps to ensure full participation in this first census of the new millennium. At the same time, the Bureau will continue its long tradition of protecting the personal information of America's citizens, and no other Government agency will be able to see any individual or family census form. I strongly urge every man and woman living in the United States to fill out and return his or her census form or to cooperate with census takers who will help them do so.

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by virtue of the authority vested in me by the Constitution and laws of the United States, do hereby proclaim April 1, 2000, as Census Day. I call upon all the people of the United States to observe this day with ceremonies, activities, and programs that raise awareness of the importance of participating in Census 2000.

IN WITNESS WHEREOF, I have hereunto set my hand this first day of April, in the year of our Lord two thousand, and of the Independence of the United States of America the two hundred and twenty-fourth.

William J. Clinton

CONTENTS

Chapter 1. **The Context of Census 2000**

INTRODUCTION	3
Major Events in the Planning and Conduct of Census 2000.	4
The Census Cycle and Cost of Census 2000.	4
Legal Authority	5
Organization of the Census Bureau	8
THE POLITICAL CONTEXT	8
THE STATISTICAL CONTEXT	11
Data Collection Forms	12
Sampling for Nonresponse Follow-Up	13
Integrated Coverage Measurement (ICM)	14
Contingency Planning	15
Sampling Decision and Revised Operational Plan Incorporating the A.C.E.	16
Coverage Measurement.	16
The ESCAP process	16
THE TECHNOLOGICAL CONTEXT	17
Data Collection	18
Data Capture and Processing.	18
Data Dissemination	19
THE LEGAL CONTEXT	20
Resolution of 1990 Census Adjustment Litigation	20
Legislation That Set the Stage for the Census 2000 Sampling Litigation.	21
Census 2000 Litigation.	21

Chapter 1: The Context of Census 2000

INTRODUCTION

The 2000 Census of Population and Housing—the twenty-second decennial census of the United States—was taken as of April 1, 2000, by the U.S. Census Bureau, an agency of the U.S. Department of Commerce. This census covered the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands of the United States, the Pacific Island Areas (American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and a number of smaller islands), and federal civilian and military employees and their dependents living overseas in 2000.

The population and number of housing units counted and tabulated in each of the areas covered by Census 2000 were as follows in Table 1-1.

Table 1-1.
Population and Number of Housing Units on April 1, 2000, by Political Unit

Political unit	Population	Number of housing units
United States	281,421,906	115,904,641
Puerto Rico.....	3,808,610	1,418,476
American Samoa.....	57,291	10,052
Guam.....	154,805	47,677
Northern Mariana Islands.....	69,221	17,566
U.S. Virgin Islands.....	108,612	50,202
U.S. minor outlying areas	316	(NA)
U.S. population abroad.....	576,367	(NA)

(NA) Not applicable.

Source: U.S. Census Bureau, 2000 Census of Population and Housing, *United States Summary: 2000, Population and Housing Unit Counts*, Part 1 (PHC-3-1), Table 1.

The data collected for the 50 states, the District of Columbia, and Puerto Rico were derived from a limited number of basic questions asked about every person and about every housing unit (referred to as the “100 percent” or “short-form” items) and from an additional set of questions asked of only a sample of the population and their housing units (referred to as “sample” or “long-form” questions). The Census Bureau relied on two basic questionnaires to collect these data: a “short form,” containing only the 100 percent questions, and a “long form,” containing both the 100 percent questions and the additional sample questions. In the Virgin Islands and the Pacific Island Areas, the data were derived from questions asked about the entire population and about every housing unit; no questions were asked on a sample basis.

Census stakeholders (government agencies, nonprofit organizations, academic and policy researchers, and private companies) showed considerable interest in demographic change and its political implications in the United States during the 1990s. Interest focused particularly on the racial and ethnic composition of the population that occurred during a decade of immigration and differential birth and death rates. The 2000 Census figures revealed the breakdowns shown in Table 1-2.

Table 1-2.
Population by Race and Hispanic Origin for the United States: 2000

Race	Population	Percent of total population
Total population	281,421,906	100.0
One race.....	274,595,678	97.6
White.....	211,460,626	75.1
Black or African American.....	34,658,190	12.3
American Indian and Alaska Native.....	2,475,956	0.9
Asian.....	10,242,998	3.6
Native Hawaiian and Other Pacific Islander.....	398,835	0.1
Some Other Race.....	15,359,073	5.5
Two or more races.....	6,826,228	2.4
Hispanic origin (of any race).....	35,305,818	12.5

Source: U.S. Census Bureau, Census 2000 Summary File 1 (SF 1), 100 Percent Data, Table DP-1 ("Profile of General Demographic Characteristics: 2000").

The increase of 32.7 million people in the U.S. population during the 1990s was the largest census-to-census increase in American history.¹ An important change between the 1990 and 2000 censuses was that in 2000 respondents had the option of selecting one or more race categories to indicate racial identity. Because of this and other changes, Census 2000 race data are not directly comparable with data from earlier censuses. In the table above, the total population (281,421,906) is equal to those reporting themselves as identifying with one race (274,595,678) added to those reporting two or more races (6,826,228). In this classification system, respondents claiming Hispanic origin may identify with any race or combination of races. While the overwhelming majority of respondents (97.6 percent) reported only one race, when given an opportunity to express themselves, nearly 7 million respondents identified with two or more races.²

Major Events in the Planning and Conduct of Census 2000

Modern census taking is an enormously complex process. The chronological list of events in Appendix A, "Major Events in the Planning and Conduct of Census 2000" gives a sense of the range of issues and activities with which the Census Bureau had to grapple in planning and conducting Census 2000.

The Census Cycle and Cost of Census 2000

Traditionally the census budget cycle lasted for 10 years, from October 1 of the year ending in "3" before the census year until September 30 of the year ending in "3" after the census. However, the amount of planning, testing, and rethinking that characterized Census 2000 required that the Census Bureau begin preparations in 1987. After a thorough assessment of the 1990 census, the agency adopted an ambitious plan in 1995 involving extensive expansion in the use of probability sampling in Census 2000. However, the U.S. Supreme Court concluded in January 1999 that the Census Bureau's governing statute, Title 13 of the U.S. Code, forbade the use of sampling for determining congressional reapportionment. Since sampling for reapportionment purposes was a key element of the 1995 plan, this ruling caused a significant compression of the time schedule.

Census 2000 cost approximately \$6.5 billion in nominal dollars, created about 860,000 jobs, and employed as many as 550,000 people during the peak of operations in 2000.

¹ Marc J. Perry and Paul J. Mackun, "Population Change and Distribution: 1990 to 2000," Census 2000 Brief, C2KBR/01-2, April 2001, p. 1.

² Elizabeth M. Grieco and Rachel C. Cassidy, "Overview of Race and Hispanic Origin," Census 2000 Brief, C2KBR/01-1, March 2001, pp. 1-3, 5, 10-11.

Legal Authority

Census Day for the United States was April 1, 2000.³ On December 28, 2000, Secretary of Commerce William M. Daley delivered to President William Jefferson Clinton the Census Bureau's official population counts by state for purposes of reapportioning the seats in the U.S. House of Representatives. The President formally transmitted the tabulations to the House on January 6, 2001. Included in the delivery was a statement of the number of seats per state calculated according to the "equal proportions" method the Congress had specified.⁴

The transmission of the reapportionment information occurred because the U.S. Constitution required the Congress to carry out the census in "such manner as they shall by Law direct" (Article I, Section 2). In 1954, Congress codified the statutes authorizing the decennial census, other censuses, and economic and demographic surveys conducted by the Census Bureau under a pledge of confidentiality to respondents as Title 13, U.S. Code.⁵ Following its adoption, Title 13 was amended several times, and it governed Census 2000.

Initially, apportionment data had to be delivered to the President 8 months from Census Day. In 1976, Public Law (P.L.) 94-521 extended the date for delivering apportionment data to the president to 9 months from Census Day.

In 1975, P.L. 94-171 amended Title 13 and required the Census Bureau to deliver to each state, within 1 year after Census Day, population counts for officials to use in drawing state and local legislative boundaries that would comply with court mandates for "equal representation." The agency transmitted all these materials—for more than 8 million census blocks and nearly 130,000 state-provided voting districts—by March 31, 2001.

The apportionment that followed Census 2000 shifted 12 seats in the U.S. House of Representatives among 18 states (see Table 1-3). Eight states increased their representation in the 108th Congress that convened in January 2003, while ten states lost seats. Of the eight states that gained seats, four (AZ, FL, GA, and TX) gained two seats each; four others (CA, CO, NV, and NC) gained one seat each. Two states, NY and PA, lost two seats each; CT, IL, IN, MI, MS, OH, OK, and WI each lost one seat.

Between 1990 and 2000, the regional pattern of change in representation reflected the country's shift in population from the Northeast and Midwest to the South and West (see Figure 1-1). The South and West experienced net gains of five seats each, while the Northeast and Midwest each lost five seats. Of the four census regions, the South had the largest share of seats (35 percent), followed by the Midwest and the West (23 percent each), and the Northeast (19 percent).

³ Census Day has been April 1 for each decennial enumeration since 1930. Most census questions were to be answered with reference to April 1, 2000, regardless of the actual date the respondent or enumerator completed the questionnaire. (The question, "LAST WEEK, did this person do ANY work for either pay or profit?" and related questions on labor force status referred to the full calendar week or other time period prior to the completion of the questionnaire. However, the question on residence 5 years ago specified April 1, 1995, as the reference date.) In remote Alaska, enumerators began making their rounds in January, before the spring thaw, but asked all questions in relation to Census Day. If a birth was expected between then and April 1, the enumerator asked the respondent to mail in a report for the new arrival.

⁴ See U.S. Census Bureau, "Computing Apportionment," 2001, available on the Internet at <<http://www.census.gov/population/www/censusdata/apportionment/computing.html>>, accessed on October 10, 2007. For an overview of the various methods used to apportion seats in the U.S. House of Representatives, see U.S. Census Bureau, "Counting for Representation: The Census and the Constitution," 1987; and David McMillen, "Apportionment and Districting," in *Encyclopedia of the U.S. Census*, Margo J. Anderson (ed.) (Washington, DC: Congressional Quarterly Press, 2000), pp. 34–42.

⁵ The Census Bureau also takes surveys on a reimbursable basis for other sponsoring agencies under the authority of Title 15, U.S. Code, which does not extend the confidentiality guarantee of Title 13 to the information provided by respondents but does extend the confidentiality standards, if any, of the sponsoring agency to respondent information.

Table 1-3.

**Apportionment Population and Number of Representatives by State:
Census 2000**

State	Apportionment population	Number of apportioned representatives based on Census 2000	Change from 1990 census apportionment
Total apportionment population¹	281,424,177	435	(NA)
Alabama	4,461,130	7	0
Alaska	628,933	1	0
Arizona	5,140,683	8	+2
Arkansas	2,679,733	4	0
California	33,930,798	53	+1
Colorado	4,311,882	7	+1
Connecticut	3,409,535	5	-1
Delaware	785,068	1	0
Florida	16,028,890	25	+2
Georgia	8,206,975	13	+2
Hawaii	1,216,642	2	0
Idaho	1,297,274	2	0
Illinois	12,439,042	19	-1
Indiana	6,090,782	9	-1
Iowa	2,931,923	5	0
Kansas	2,693,824	4	0
Kentucky	4,049,431	6	0
Louisiana	4,480,271	7	0
Maine	1,277,731	2	0
Maryland	5,307,886	8	0
Massachusetts	6,355,568	10	0
Michigan	9,955,829	15	-1
Minnesota	4,925,670	8	0
Mississippi	2,852,927	4	-1
Missouri	5,606,260	9	0
Montana	905,316	1	0
Nebraska	1,715,369	3	0
Nevada	2,002,032	3	+1
New Hampshire	1,238,415	2	0
New Jersey	8,424,354	13	0
New Mexico	1,823,821	3	0
New York	19,004,973	29	-2
North Carolina	8,067,673	13	+1
North Dakota	643,756	1	0
Ohio	11,374,540	18	-1
Oklahoma	3,458,819	5	-1
Oregon	3,428,543	5	0
Pennsylvania	12,300,670	19	-2
Rhode Island	1,049,662	2	0
South Carolina	4,025,061	6	0
South Dakota	756,874	1	0
Tennessee	5,700,037	9	0
Texas	20,903,994	32	+2
Utah	2,236,714	3	0
Vermont	609,890	1	0
Virginia	7,100,702	11	0
Washington	5,908,684	9	0
West Virginia	1,813,077	3	0
Wisconsin	5,371,210	8	-1
Wyoming	495,304	1	0

(NA) Not applicable.

¹ Includes the resident population for the 50 states, as ascertained by the Twenty-Second Decennial Census under Title 13 U.S. Code, and counts of overseas U.S. military and federal civilian employees (and their dependents living with them) allocated to their home state, as reported by the employing federal agencies. The apportionment population excludes the population of the District of Columbia.

Note: As required by the January 1999 U.S. Supreme Court ruling (*Department of Commerce v. U.S. House of Representatives*, 525 U.S. 316, 119 S.Ct. 765 (1999)), the apportionment population counts do not reflect the use of statistical sampling to correct for overcounting or undercounting.

Source: U.S. Census Bureau <<http://www.census.gov/population/www/censusdata/apportionment.html>>. Internet release date: December 28, 2000.

Apportionment of the U.S. House of Representatives for the 108th Congress



Organization of the Census Bureau

Census 2000 was administered from the Census Bureau's headquarters building in Suitland, MD, with added space in nearby "satellite" locations as needed. Large-scale clerical operations were handled at the agency's National Processing Center in Jeffersonville, IN. To house its centrally managed computer resources and as part of its recovery plan for dealing with potential disasters, the agency established a computer center in Bowie, MD, in 1997.

Twelve regional offices (ROs) throughout the country undertook various current surveys and supervised decennial census activities in their areas. These offices were located in Atlanta, GA; Boston, MA; Charlotte, NC; Chicago, IL; Dallas, TX; Denver, CO; Detroit, MI; Kansas City, KS; Los Angeles, CA; New York, NY; Philadelphia, PA; and Seattle, WA. For the census field enumeration, each RO established a companion "regional census center" (RCC) nearby. The 12 RCCs managed 520 temporary local census offices (LCOs) throughout the 50 states and the District of Columbia for data collection. The Boston RCC also supervised nine LCOs and an area office in Puerto Rico, while headquarters directed five LCOs in the Virgin Islands and the Pacific Island Areas.

Whereas the 1990 census had seven processing offices (Albany, NY; Austin, TX; Baltimore, MD; Jacksonville, FL; Jeffersonville, IN; Kansas City, KS; and San Diego, CA), Census 2000 involved four data capture centers, located in:

- Phoenix, AZ
- Pomona, CA
- Rosedale, MD
- Jeffersonville, IN (in the Census Bureau's permanent facility there).

The agency awarded data-processing contracts to:

- Lockheed Martin Mission Systems to develop and test the hardware and software needed to control census mail returns and to convert the answers on the questionnaires into an electronic format suitable for computer processing.
- TRW, Incorporated, to supply three data capture centers including staff, office equipment, supplies, and training and procedures to process completed census questionnaires.

The Census Bureau's permanent staff provided planning, direction, and support services for Census 2000. However, temporary staffs in the RCCs, LCOs, and data capture centers were by far the largest component of the decennial census work force.

THE POLITICAL CONTEXT

Critics noted that despite some improvements, the 1990 census cost considerably more per person and per household than earlier censuses and produced an increase in both the relative and absolute numbers of people missed (or "undercounted").⁶ In November 1990, Secretary of Commerce Robert Mosbacher created the "Task Force for Planning the Year 2000 Census and Census-Related Activities for 2001–2009" to develop an effective design for Census 2000. The resulting plan sought to improve the quality and availability of data for federal and nonfederal data users and increase overall census coverage, while keeping a lid on costs.⁷ The agency's review of its decennial census assumptions and methodologies took on greater urgency in the wake of Secretary Mosbacher's decision (on July 15, 1991) not to adjust 1990 census data to correct for the differential undercount and criticism of the Census Bureau's planning for the 1990

⁶ See, for example, Barry Edmonston and Charles Schultze (eds.), *Modernizing the U.S. Census* (Washington, DC: National Academy Press, 1995), pp. 30–58.

⁷ For a discussion of the work of the task force, see Chapter 2, "Planning the Census."

census as well as implementation of the plan. Many groups, organizations, and jurisdictions with which the agency had worked to improve census coverage during data collection joined lawsuits that attempted to force the Census Bureau to adjust the 1990 census.⁸

Without significant changes in census-taking methodology, a number of members of Congress on both sides of the aisle saw no reason to believe that the next census would not fall prey to many of the difficulties that affected the 1990 effort. Congressman Thomas Sawyer (D-OH), the chair of the Census Bureau's oversight subcommittee in the House, introduced a bill in late 1990 that required the Secretary of Commerce to hire the National Academy of Sciences (NAS) to examine ways for the government to conduct the most accurate census possible in 2000 and beyond, by improving enumeration methods, assessing alternative ways of collecting population data, and evaluating the appropriateness of using probability sampling to refine the population information collected via traditional census methods. The bill also required the NAS to assess the extent to which sample population data were still needed and if so, whether viable alternatives existed to traditional data collection methods such as mailout/mailback of census questionnaires and personal interviews. That bill, the Decennial Census Improvement Act, was signed into law in October 1991.⁹

In response to this congressional mandate, NAS established a panel to examine ways to improve census enumeration methods, collect the information needed for a basic population count, and determine the appropriateness of using sampling methods to obtain the population count. The panel was also instructed to evaluate the strengths and weaknesses of each alternative and analyze its cost effectiveness. The Census Bureau also asked NAS to conduct a second study to assess technical issues associated with the implementation and evaluation of promising methodologies. By the middle of the decade, the NAS panels had concluded that expanding traditional census methods would improve neither coverage nor data quality. NAS recommended that Census 2000 significantly expand the use of sampling to address both coverage improvement and cost control.¹⁰ Similarly, the General Accounting Office (GAO)—renamed the Government Accountability Office in July of 2004—urged the agency to explore using statistical sampling for part or all of nonresponse follow-up (NRFU), the process of collecting census information for housing units for which there was no response during the mailout/mailback phase of the census, both to reduce costly data collection activities and to improve census coverage.¹¹ Members of several of the Census Bureau's advisory committees also suggested that the agency explore the possibilities for cost reduction and improved accuracy associated with the increased use of sampling in Census 2000, but they cautioned that a substantial educational effort would be needed to explain sampling procedures to nonstatisticians.

One improvement both critics and supporters generally favored involved Census Bureau efforts to increase the quality and comprehensiveness of the decennial census address list. The Census Address List Improvement Act of 1994 modified Title 13 to allow the Census Bureau to share its address list with state, local, and tribal governments, which in turn permitted those jurisdictions to review the Census Bureau's list and suggest modifications and corrections based on local knowledge.¹² The goal was to help the Census Bureau compile the most accurate and complete address list for use in its censuses and surveys.

This law required the Secretary of Commerce to publish standards for address information that local jurisdictions could submit for use in the development of census address lists and to develop and publish a schedule for the Census Bureau to receive, review, and respond to submissions. It

⁸ For more detail on the lawsuits associated with the 1990 census, see U.S. Census Bureau, *1990 Census of Population and Housing History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), Chapter 12, "Legislation and Litigation." For a description of the resolution of the principal lawsuit seeking to adjust the 1990 census, *Wisconsin v. City of New York* (517 U.S. 1 (1996)), see Chapter 11, "Legal Issues" of this history.

⁹ House of Representatives (H.R.) 3280, Decennial Census Improvement Act of 1991. This bill was signed into law as P.L. 102-135 on October 24, 1991.

¹⁰ See Edmonston and Schultze, *Modernizing the U.S. Census* and Duane L. Steffey and Norman M. Bradburn (eds.), *Counting People in the Information Age* (Washington, DC: National Academy Press, 1994).

¹¹ U.S. General Accounting Office, "Decennial Census: 1990 Results Show Need for Fundamental Reform," GGD 92-94, June 9, 1992.

¹² H.R. 5084 became P.L. 103-430 on October 31, 1994.

ordered the Secretary to give locally appointed census liaisons access to census information and an explanation of their duties and obligations. The law also subjected these liaisons to the confidentiality requirements and wrongful disclosure penalties authorized in Title 13. Finally, the statute required the U.S. Postal Service to provide address and address-related information to the Census Bureau for use in the construction and updating of the latter's address list to be used in censuses or surveys.

Early in the 1990s, members of the Census Bureau's Year 2000 Research and Development Staff and the Task Force for Planning the Year 2000 Census held focus group meetings with stakeholders representing hundreds of organizations to discuss the kinds of changes that might be needed to conduct a successful census in the social, economic, and technological environment that was likely to exist in 2000. One of the task force's components, the technical committee (composed of senior statistical staff from the Census Bureau and other federal statistical agencies), developed 14 alternative census designs that served as the basis for a major census test in 1995 and several later tests. The task force's Census 2000 Advisory Committee recommended that the Census Bureau test sampling and estimation techniques for enumerating nonresponding households. The task force's final report advocated five avenues for improving Census 2000:

- Fostering greater involvement of census stakeholders.
- Implementing new ways to reduce the differential undercount.
- Using new technology to capture census information more efficiently.
- Increasing the use of statistical methods to reduce the differential undercount.
- Using new methods to collect long-form data.¹³

Evaluations of the 1990 census and of small-scale research early in the 1990s encouraged Census Bureau executives to conclude that a redesigned census that incorporated sampling for NRFU, relied on Integrated Coverage Measurement (ICM) (see below) to help reduce the differential undercount, used optical mark and character recognition hardware and software, and included a comprehensive outreach and promotion program could improve census accuracy and reduce cost. The Census Bureau's plan for Census 2000, released in February 1996, used these conclusions as guidance. Among other elements, the plan included four central strategies: (1) build partnerships at every stage of the process, (2) keep the census simple for respondents, (3) use technology intelligently, and (4) increase the use of statistical methods.¹⁴

Reaction to the plan from advisory groups and the professional statistical and demographic community was generally positive. However, significant criticism did arise in some quarters, notably among members of Congress. Some congressional critics believed that the Census Bureau's plan to use probability sampling techniques (see the next section, "The Statistical Context") to produce reapportionment and/or redistricting data violated the Constitution and/or Section 195 of the agency's operating statute, Title 13, U.S. Code.

Republicans won control of both houses of Congress in the 1994 mid-term election. During the next few years, legislators opposed to the administration's plan proposed legislation to prevent the Census Bureau from implementing it. The proposed legislation included attempts to amend Title 13 to explicitly prohibit the use of sampling or other statistical techniques to determine state population totals for the purpose of apportionment and attach language to appropriations bills preventing the use of appropriated funds for the development of a census plan that would involve statistical sampling in the production of the apportionment and/or redistricting data. Congressional critics also prepared a freestanding report that opposed the Census Bureau's plan to use statistical sampling to determine apportionment population counts. Votes often adhered to party lines, with the Republican majority opposing the use of statistical sampling for producing apportionment counts and supporters of the Democratic Clinton administration favoring it.

¹³ U.S. Census Bureau, "Reinventing the Census: Global Report of the Task Force for Planning the Year 2000 Census," April 1995.

¹⁴ U.S. Census Bureau, "The Plan for Census 2000," February 28, 1996; a slightly revised version incorporating suggestions from several sources was released on April 5, 1996.

By the fall of 1997, risks of stalemate over the issue had become quite substantial. Negotiations produced a compromise that was embodied in the FY 1998 Department of Commerce appropriations bill. The compromise allowed the Census Bureau to continue to plan for the use of sampling, but required the agency to develop a plan for taking Census 2000 without using sampling. For the next year or so, the Census Bureau continued to flesh out its plan for a census that incorporated sampling while also laying out a detailed proposal for a census using traditional data-collection methods. The process was called “dual-track planning.” The 1997 compromise also contained provisions for judicial review of the use of sampling techniques to produce apportionment population counts or redistricting data. The statute also established an oversight panel called the Census Monitoring Board, composed of four members appointed by the administration and four by the Senate and House majority leadership.

In February 1998, opponents of sampling filed two lawsuits challenging the legality and constitutionality of the sampling procedures the Census Bureau planned to use in Census 2000. Ultimately, the two cases reached the U.S. Supreme Court, where they were consolidated.

On January 25, 1999, the Supreme Court ruled that Section 195 of Title 13 precluded the use of sampling to produce congressional apportionment counts.¹⁵ The political battle over the role of sampling in Census 2000 was nearly over, but Census Day was just over 14 months away. Dual-track planning was scrapped, but the census plan that the agency had been working on for more than 5 years went with it. The Census Bureau had to implement a revised and expanded version of the 1990 census, within a relatively short period of time.

A little over 2 years later, in March 2001, a committee of senior Census Bureau managers and statisticians confronted another politically charged issue when the committee recommended against adjusting the official Census 2000 block-level data for the purpose of congressional redistricting.¹⁶ Unresolved statistical inconsistencies in the adjusted data led to this recommendation, which was adopted by Secretary of Commerce Donald Evans on March 6, 2001.¹⁷

THE STATISTICAL CONTEXT

Since its introduction in the 1940 decennial census, probability sampling has remained an integral part of U.S. census taking. The Census Bureau, together with several other government agencies, was instrumental in developing the theory and practice of applying probability sampling to finite human populations. Though initially introduced as a data collection device, over the years the Census Bureau expanded its use of sampling for quality assurance, research and development, and improving and evaluating census coverage. In the late 1940s, a comparison of aggregate Selective Service registration information and 1940 census data revealed that efforts to count the entire population of the United States were subject to a systematic “undercount” of certain population groups (specifically, African American males and young children).¹⁸ During the 1970s, the Census Bureau was deeply involved in coverage evaluation studies to determine the characteristics of those typically missed during the census. The agency devoted considerable resources during the 1980s to expand its understanding of the characteristics of undercounted and overcounted (i.e., double counted) populations and of how to use statistical techniques to correct these errors in raw census counts.

For Census 2000, the agency planned to use sampling for four major purposes:

- **Long-form population and housing characteristics.** The Census Bureau planned to collect detailed information, such as educational attainment, income in 1999, year the housing unit was built, etc., on a representative portion of the nation’s people and their living quarters. The results were to be used to estimate the characteristics of the nation’s entire population and housing stock.

¹⁵ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999).

¹⁶ U.S. Census Bureau, “Report of the Executive Steering Committee for Accuracy and Coverage Evaluation Policy,” March 1, 2001.

¹⁷ For a description of some of these inconsistencies, see the “Coverage Measurement” section of Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

¹⁸ See Daniel O. Price, “A Check on Under-Enumeration in the 1940 Census,” *American Sociological Review*, Vol. 12, Issue 1, February, 1947, pp. 44–49.

- **Nonresponse follow-up (NRFU).** Following the conclusion of the mailout/mailback phase of the census, the Census Bureau expected to send enumerators into the field to collect census information from enough residents of housing units in each census tract (an administrative unit containing an average of about 1,700 housing units and 4,000 people) to increase the response rate in each tract to 90 percent. After reaching the 90 percent target, the remaining 10 percent of the housing units and their inhabitants would be enumerated on a sample basis. Information from the residents of a 1-in-10 sample of the remaining housing units would be used to estimate the number of nonrespondents and their characteristics.
- **Vacant housing unit follow-up.** Between Census Day (April 1, 2000) and the end of NRFU, census workers planned to visit 30 percent of the housing units designated as vacant by the U.S. Postal Service to verify their occupancy status and gather information on the number and characteristics of vacant units.¹⁹
- **Integrated Coverage Measurement (ICM).** After NRFU, census enumerators would interview residents of a random sample of about 750,000 housing units. The purpose of this survey was to determine the proportions of the population living in the sample blocks included in and excluded from earlier phases of the census. This would be accomplished by matching housing units in the ICM sample with the same housing units in the census. The results of this survey would be used to statistically adjust the original census counts.

The U.S. Supreme Court's January 25, 1999, decision prohibiting the use of sampling to produce state population counts for reapportioning seats in the U.S. House of Representatives effectively ended the Census Bureau's effort to use statistical sampling for the last three of these activities.²⁰ However, the agency continued to entertain the possibility of using statistically adjusted data for nonapportionment purposes.

Data Collection Forms

For Census 2000, the agency designed a 100 percent ("short") questionnaire containing seven inquiries that elicited information about all inhabitants of the United States. The agency needed the information that was generated in the responses to the age, race, and ethnicity items to fulfill its mandate under the Constitution; subsequent "one-person, one-vote" decisions of the U.S. Supreme Court; and the Voting Rights Act of 1965. These precedents require the Census Bureau to supply such data with a high degree of accuracy for the purposes of legislative reapportionment and redistricting. A sample ("long") form, containing an additional 46 questions as well as the 100 percent inquiries, was designed to collect detailed demographic and housing characteristics. These questions were required by law to be included in the census, specifically to implement certain federal programs or because the government concluded that the decennial census was the only practical source of the data.²¹ The Census Bureau used sampling to control costs and to maintain or reduce respondent burden.

Several of the alternative census designs the Census Bureau considered in 1992 and 1993 contained components that called for significant modifications to collecting sample data in the census.²² One alternative was called matrix sampling, which involved the use of two sample forms containing overlapping questions. For example, a 20 percent sample could be divided into a 15 percent sample and a 5 percent sample. Some questions would appear on only one version of the questionnaire while others would be printed on both versions. This design would enable the Census Bureau to collect data on a larger number of topics while minimizing respondent burden. After consulting a variety of stakeholders, the Census Bureau determined that this option was

¹⁹ After the January 1999 Supreme Court ruling in *Department of Commerce v. U.S. House of Representatives*, the Census Bureau's revised plan included a 100 percent follow-up of such units.

²⁰ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999).

²¹ U.S. Bureau of the Census, "Preparing for Census 2000: Questions Planned for Census 2000," March 1998, and Edmonston and Schultze, *Modernizing the U.S. Census*, p. 23.

²² U.S. Bureau of the Census, "2000 Census Research and Development Alternative Designs Program," June 1992 (unpublished paper), and U.S. Bureau of the Census, "Design Alternative Recommendations," May 17, 1993 (unpublished paper).

unacceptable because it would sacrifice certain small-area data needs, particularly the ability to produce cross tabulations at low levels of geography with acceptable accuracy and reliability and because of the difficulty of controlling multiple versions of the same questionnaire during data collection.

Another option was to eliminate direct data collection altogether and rely on administrative records to provide the necessary information. The agency rejected this approach for a variety of technical reasons (for example, potential coverage error and its implications for the undercount, difficulties in obtaining the necessary data sets in suitable machine-readable formats and in matching and unduplicating those data sets, etc.). The number of statutory amendments needed to implement this option and concern about public perception also precluded its use.

Several designs were proposed to severely reduce or eliminate sample data collection and focus on collecting only the data required by the Voting Rights Act. While these options did reduce cost and respondent burden, most entailed an unacceptable loss of data needed for federal, state, and local programs. However, a variation on this approach—that is, minimal data collection in the decennial census year supplemented by the collection of more detailed personal and housing data from a changing sample of between 250,000 and 400,000 housing units per month—has been designated as the methodology that will be used in the 2010 Census.²³

The sampling design for the detailed questionnaire that the Census Bureau implemented in Census 2000 was similar to that used in the 1990 census and included:

- An overall sampling rate of about 1-in-6 addresses, or 17 percent.
- A sampling rate of 1 in 2 in general purpose governmental units with fewer than 800 housing units and in remote Alaska.
- A sampling rate of 1-in-4, 1-in-6, or 1-in-8 households in other governmental units.

The Census Bureau argued that variable-rate sampling would allow it to allocate the sample efficiently while reducing respondent burden and maintaining the accuracy and reliability of census data for lower geographic levels.²⁴

Sampling for Nonresponse Follow-Up

Sampling for NRFU represented an attractive option for several reasons. Nearly 20 percent of the \$2.6 billion cost of the 1990 census was spent on NRFU (the process of collecting census information for housing units for which there was no response during the mailout/mailback phase of the census). The Census Bureau estimated that nonresponse in Census 2000 would total approximately 34 million housing units. By sampling these housing units instead of trying to contact someone living in each one, the agency proposed it could achieve significant cost savings and reduce substantially the amount of time needed to complete the operation. Finally, this later phase of data collection typically suffers a marked decrease in data quality. The agency therefore argued that sampling for NRFU might actually increase data quality by allowing the Census Bureau to concentrate its resources on obtaining reliable data from a portion of nonrespondents over a shorter period of time rather than requiring it to contact all nonrespondents.²⁵

Following a largely successful test of sampling for NRFU in 1995, Census Bureau statisticians and managers evaluated the results of the test and consulted with a wide variety of stakeholders. On February 26, 1996, the Census Bureau released “The Plan for Census 2000,” which announced that the agency would cut off NRFU at 90 percent (“truncation at 90 percent”) and sample the remaining 10 percent as the design for sampling for nonresponse.

²³ The survey component of this program is called the American Community Survey. For an overview, see U.S. Census Bureau, *Design and Methodology: American Community Survey*, Technical Paper No. 67, May 2006.

²⁴ U.S. Census Bureau, “Census 2000 Operational Plan Using Traditional Census-Taking Methods,” January 1999, and U.S. Census Bureau, “Program Master Plan: Census 2000 Long Form Sampling Plan,” Census 2000 Informational Memorandum No. 39, February 9, 2000.

²⁵ Michael L. Cohen, Andrew A. White, and Keith F. Rust (eds.), *Measuring a Changing Nation: Modern Methods for the 2000 Census* (Washington, DC: National Academy Press, 1999), pp. 26–30, and Steffey and Bradburn, *Counting People in the Information Age*, p. 98.

Over the next 7 months, senior Commerce Department and Census Bureau officials, led by Census Bureau Director Martha Farnsworth Riche, traveled throughout the country explaining the Census 2000 plan to stakeholders and other interested people. Census Bureau staff and invited stakeholders also discussed the new census plan at congressional committee hearings, agency advisory committee meetings, and at numerous academic forums.

One result of these meetings and consultations was that early in 1997, Census Bureau officials agreed to modify several aspects of the plan.²⁶ Direct sampling replaced truncation at 90 percent because of the superiority of the former in operational terms and in mathematical accuracy, the positive responses from the agency's advisors, and the agency's efforts to accommodate congressional requests for a less costly census. The agency also decided to use census tracts rather than counties as the basis for implementing direct sampling for NRFU because low mail-response areas within counties might be undersampled if counties were used to measure response rates.

Throughout the latter part of 1997 and 1998, the agency further refined this portion of the plan, but the U.S. Supreme Court's January 1999 decision prohibiting the use of sampling in the production of population statistics to be used for reapportionment ended the Census Bureau's plan to use sampling for NRFU.

Integrated Coverage Measurement (ICM)

Evaluations of past decennial censuses revealed a persistent greater-than-average net undercount of minorities and other hard-to-count population groups and areas. These studies also indicated that increasing the number of conventional counting operations did not eliminate or reduce these undercounts in the 1990 census. The Census Bureau concluded that the design for Census 2000 should incorporate the results of a coverage measurement survey conducted immediately following basic data collection as an integral part of completing the census—that is, Integrated Coverage Measurement (ICM).

The agency used a post-enumeration survey (PES) to measure coverage in the 1990 census. This approach involved conducting an independent survey of the population after completing data collection for the regular census. Analysts combined the results of the PES with the census to produce an estimate of the total population. The technique used to estimate total population size was called dual system estimation (DSE), because it used two independent sources of information (the census and the PES).

While the Census Bureau assessed the characteristics of the PES and alternative approaches to possibly reducing undercounts and worked on ways to overcome the inherent problems of each, it also pursued the development of a one-number census.²⁷ By the term “one-number census,” the Census Bureau meant that the decennial census should be designed to produce the best possible single set of results for persons, housing units, and households by the legally mandated deadlines. The one-number census began with the belief that the results of ICM would be incorporated, or integrated, into the official census results. The purpose of ICM was to measure and correct for overall and differential net coverage error (“undercount”) that characterized previous censuses and in so doing, produce a one-number census.

²⁶ U.S. Census Bureau, “Changes to the Census 2000 Plan Since Its Roll Out (February 28, 1996),” March 4, 1997.

²⁷ The one-number census is discussed in U.S. Bureau of the Census, “Issues in Coverage Measurement and a Single-Number Census,” September 22, 1992. See also Catherine Keeley and Susan M. Miskura, “Reducing Differential Undercount and Improving Coverage Overall in the 2000 Census,” June 8, 1993.

In the 1995 Census Test, the Census Bureau compared the effectiveness of DSE in correcting for the undercount with alternative statistical adjustment methodologies.²⁸ One major criterion for evaluating the estimates derived from DSE was whether DSE accounted for more people in the traditionally undercounted population groups than the alternatives. The ICM evaluation revealed that DSE resulted in increased estimated counts for some traditionally undercounted groups (mainly Blacks and renters), while the alternative approach (called CensusPlus) did not.²⁹ Both DSE and CensusPlus produced increased estimates of Hispanics, but only DSE resulted in increased estimated counts for Asians and Pacific Islanders.

Census Bureau officials believed that ICM was the most important of all the innovations designed to improve census accuracy. Further evaluations of the 1995 and 1996 Census Tests, combined with the necessity of finalizing a decision on the method to be used in the 1998 Dress Rehearsal, led agency officials to choose the DSE approach in the spring of 1997. During the remainder of 1997 and 1998, Census Bureau planners focused on refining this method and preparing to test these modifications in the Census 2000 Dress Rehearsal in 1998.

As agency statisticians drafted evaluations of dress rehearsal operations, the Supreme Court ruled that statistically adjusted census data derived from sampling could not be used for reapportioning seats in the House of Representatives. That ruling ended the Census Bureau's effort to implement ICM in Census 2000. A smaller version of this coverage measurement survey, renamed the Accuracy and Coverage Evaluation (A.C.E.) survey, was used to evaluate the coverage of Census 2000 and possibly to statistically adjust census counts for nonapportionment purposes (although, as discussed elsewhere in this chapter, poor data quality caused such an adjustment from taking place.)

Contingency Planning

In the summer of 1997, Census Bureau staff began to prepare for the possibility of a census that would include neither sampling for NRFU nor an ICM.³⁰ Early work focused on preparing alternative operational time schedules, identifying the activities to be dropped from the regular census schedule, and specifying those that would have to be expanded to compensate for the lack of planned sampling procedures.

By fall 1997, the contingency plan began to take shape. Spurred on by significant congressional opposition to sampling and well aware that its FY 1998 appropriations statute (P.L. 105-119) required the agency to "become prepared to implement a 2000 decennial census, without using statistical methods . . .," the Census Bureau increased efforts to identify elements and operations common to both designs to facilitate planning. By early 1998, two lawsuits had challenged the Census Bureau's plan to use statistical sampling to produce population figures for reapportionment.³¹ All the while, the Census Bureau continued to plan for a census with sampling for NRFU and ICM, as well as a traditional census without them. Additionally, the agency modified plans for the 1998 Dress Rehearsal to incorporate this dual-track strategy. In keeping with its dual-track approach, the agency issued its "Census 2000 Operational Plan Using Traditional Census-Taking Methods" in early January 1999. As noted above, the Census Bureau's original plan for Census 2000 included the following four strategies: (1) build partnerships at every stage of the process,

²⁸ Mary H. Mulry and Richard Griffin, "Comparison of CensusPlus and Dual System Estimation in the 1995 Census Test," *Proceedings of the Survey Research Methods Section*, American Statistical Association, 1996, pp. 848–53. For a description of CensusPlus, see Chapter 2, "Planning the Census." The Census Bureau also considered a third strategy, dubbed SuperCensus, that was similar to CensusPlus but would begin during the mailout/mailback period, not after the completion of NRFU. Also, regular census data collection would not take place in SuperCensus blocks, and the only available counts would be those that incorporated ICM. Evaluations of regular census operations would not be possible because there was no mailout of census questionnaires. Another problem with SuperCensus was the possibility that ratios of people to housing units would be too variable to permit accurate estimates. As a result of these difficulties, the agency dropped the SuperCensus option. See Steffey and Bradburn, *Counting People in the Information Age*, pp. 109–11.

²⁹ E. Ann Vacca, Mary Mulry, and Ruth Ann Killion, "The 1995 Census Test: A Compilation of Results and Decisions," 1995 Census Test Results Memorandum No. 46, April 1, 1996.

³⁰ "Issues Briefing—Contingency Planning for Census 2000 with No Sampling," October 7, 1997, revised version, October 20, 1997.

³¹ The two cases were *Glavin v. Clinton* and *U.S. House of Representatives v. Department of Commerce* (as filed). For more information on these cases, see Chapter 11, "Legal Issues."

(2) keep the process simple, (3) use technology intelligently, and (4) expand the use of statistical methods. While the first three strategies remained the same, in the January 1999 operational plan the fourth was changed to “use special techniques to improve coverage,” emphasizing the modification of existing address listing and coverage improvement operations rather than the use of statistical methods.

Sampling Decision and Revised Operational Plan Incorporating the A.C.E.

In November 1998, the U.S. Supreme Court heard oral argument concerning the two pending lawsuits. Its ruling, issued on January 25, 1999, states that Section 195 of Title 13, U.S. Code, precludes the use of statistical sampling (including statistical adjustment based on sampling) to produce congressional apportionment numbers.³²

Given the Supreme Court ruling, the Census Bureau could no longer implement ICM to produce statistically adjusted apportionment data. However, on February 23, 1999, the Department of Commerce released “Updated Summary: Census 2000 Operational Plan,” which included a section on Accuracy and Coverage Evaluation (A.C.E.), a coverage measurement survey similar to the 1990 PES, designed to allow the Census Bureau to estimate and statistically adjust for overall and differential net coverage errors in Census 2000 for nonapportionment uses of the data.³³

Coverage Measurement

As in previous censuses, the Census Bureau used two methodologies for assessing net coverage in Census 2000.³⁴ The A.C.E. program compared the results from a coverage measurement survey to the census itself, using a methodology known as dual system estimation (DSE), to estimate net overcounts and undercounts in the census. The other methodology, known as demographic analysis (DA), produces population estimates at the national level using records or estimates of births, deaths, immigration, emigration, and Medicare enrollments as well as the results of the current and previous censuses. These population estimates were used to develop estimates of net coverage in the census and thus also provide a basis for assessing the coverage measurement survey (in this case, the A.C.E.) results for age/sex/race groups at the national level.³⁵

The ESCAP process. The Census Bureau's Executive Steering Committee for Accuracy and Coverage Evaluation Policy (ESCAP) evaluated the possible use of the statistically adjusted data produced from the A.C.E. program for redistricting and incorporation into sample data products, intercensal estimates, and survey controls.³⁶ In conjunction with its report and recommendation against adjustment of the official redistricting data, ESCAP released estimates of net coverage from the A.C.E. and DA programs.³⁷ The A.C.E. estimate of net national undercount was 1.15 percent for the total resident population. DA produced two sets of estimates, one indicating a net undercount of 0.32 percent, the other a net undercount of negative 0.65 percent or a *net overcount* of 1.8 million persons.³⁸

³² For more information on the Supreme Court decision, see the “Litigation” section of Chapter 11, “Legal Issues.”

³³ For more information on A.C.E. design, see Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

³⁴ For summary discussions of the 1990 PES and 1980 PEP programs, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), pp. 11-19–11-36, and U.S. Census Bureau, *1980 Census of Population and Housing, History, Part E*, PHC 80-R-2E (Washington, DC: Government Printing Office, 1989), pp. 9-6–9-10.

³⁵ The DA and A.C.E. programs and their results are discussed in greater detail in Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

³⁶ The Census Bureau produces annual intercensal population estimates for the nation, states, and counties (and biennial estimates for smaller geographic areas). These estimates are generally used in federal funding allocation formulae in lieu of decennial census figures (except for the year in which the census figures themselves are released), because they reflect ongoing population changes during the decade. For more information on the technical aspects of the ESCAP evaluation process, see the relevant sections of Chapter 10 and “The Debate Over the Use of Sampling” section of Chapter 11.

³⁷ *Federal Register*, Vol. 66, No. 46, March 8, 2001, pp. 14004–46.

³⁸ J. Gregory Robinson, “Accuracy and Coverage Evaluation: Demographic Analysis Results,” DSSD Census 2000 Procedures and Operations Memorandum Series B-4*, March 12, 2001, Table 3, p. 22.

It was largely because of discrepancies between the A.C.E. and DA estimates of net undercount—for both the total population and for various population groups—that ESCAP recommended against adjusting the redistricting data.³⁹ The Secretary agreed and decided that the official redistricting data would not incorporate a statistical adjustment.⁴⁰

Following the Secretary's decision, ESCAP instituted an intensive evaluation program to address its concerns regarding the accuracy of the adjusted data. This assessment found that the A.C.E. did not account for a large number of census erroneous enumerations, including many duplicates, leading to an overstatement of at least 3 million persons in the initial A.C.E. estimate of Census 2000 net undercount. The Census Bureau also produced a revised (September 2001) DA estimate that indicated a net national undercount of 0.12 percent.⁴¹

In his October 16, 2001, decision against the use of the adjusted data for nonredistricting purposes, the Census Bureau's Acting Director stated that extensive additional review would be needed to revise the adjusted data to permit their use for any purpose.⁴² The following day, the acting director announced this decision publicly, adding that the agency would continue its research and attempt to produce final revised estimates. The A.C.E. Revision II effort produced an estimated negative 0.48 percent net undercount of the resident population in Census 2000, or a national net overcount estimate of approximately one-half of 1 percent.⁴³

In addition to national-level revised estimates of percent net undercount for major race/ethnicity, tenure (that is, owner or renter), and age/sex groupings, the Census Bureau also produced and released revised estimates for states, counties, and places as part of the A.C.E. Revision II effort.

Census 2000 was the first census for which the agency estimated a net national overcount. The A.C.E. Revision II estimate of negative 0.48 percent for the total resident population is considered within the range of uncertainty surrounding the September 2001 DA net undercount estimate of 0.12 percent.

While the Census Bureau noted that the A.C.E. Revision II estimates represented the most accurate assessment available of Census 2000 coverage, it also noted technical concerns regarding the limitations of the methodology and the quality of the data. Thus, the agency determined that the intercensal population estimates would not incorporate an adjustment based on the A.C.E. Revision II estimates.⁴⁴

THE TECHNOLOGICAL CONTEXT

The Census Bureau's technical experts claimed a number of technological achievements associated with the 1990 census. These included:

- The introduction of the Topologically Integrated Geographic Encoding and Referencing (TIGER®) system for producing maps and geocoding addresses.
- The use of concurrent data capture and processing.
- Computerized tracking and control of questionnaires.
- A computerized address file.
- The first distribution of census data on CD-ROM.

³⁹ *Federal Register*, March 8, 2001, p. 14005.

⁴⁰ *Federal Register*, Vol. 66, No. 49, March 13, 2001, pp. 14520–21.

⁴¹ J. Gregory Robinson, *ESCAP II: Demographic Analysis Results, Report No. 1*, October 13, 2001, p. 2.

⁴² *Federal Register*, Vol. 66, No. 214, November 5, 2001, p. 56006.

⁴³ U.S. Census Bureau, "Decision on Intercensal Population Estimates," March 12, 2003, p. 6. (PDF version is available at <<http://www.census.gov/dmd/www/ace2.html>>.)

⁴⁴ "Decision on Intercensal Population Estimates," p. 1. For additional information regarding the A.C.E. Revision II research and results, see the "A.C.E." section of Chapter 10, "Testing, Experimentation, Evaluation, and Coverage Measurement Programs."

Despite these successes, concerns arose among census stakeholders in Congress and elsewhere about poor mail response, increased operational costs (particularly for nonresponse follow-up), and an increase in net undercount during the 1990 census. This prompted the Census Bureau to reassess several of its operations and methods for data collection, data capture and processing, and data dissemination.

Data Collection

Most research in data-collection technology prior to the 1990 census focused on address list development, questionnaire format, and alternative response methods. As the 1990 census neared completion, the director of the Census Bureau endorsed the concept of updating a master address file (MAF) throughout the decade rather than reconstructing one a few years before each census. For Census 2000, the agency updated the 1990 address control file by combining:

- The master list of addresses for mail delivery maintained by the U.S. Postal Service, called the delivery sequence file (DSF).
- A field listing operation.
- Input from local governments reviewing the address lists during the Local Update of Census Addresses (LUCA) 1998 and LUCA 1999 programs.⁴⁵

In the early 1990s, census stakeholders expressed concerns that the format and length of the long-form questionnaire adversely affected response rates. Some felt that content should be modified or reduced to include only those questions mandated by legislation or federal regulation. Others argued that the format of the questionnaire used during the 1990 census was difficult to read and discouraged response. To address this concern, the Census Bureau conducted research to develop a more “respondent-friendly” questionnaire with greater visual appeal and concise instructions. The 1996 decision to use optical mark recognition (OMR) combined with optical character recognition (OCR) for data capture simplified the design of such forms.⁴⁶

In addition to developing a new questionnaire format and in an effort to increase response, the Census Bureau explored response methods that were alternatives to mailback or enumerator returns. These alternatives included Telephone Questionnaire Assistance (TQA) and Internet Data Collection (IDC).⁴⁷ TQA provided respondents with information about the census and, for callers who met certain criteria, an option to respond to the census over the phone. IDC allowed respondents who received the short census form the option to complete an online questionnaire using their census ID number. The Census Bureau did not advertise IDC as an alternative response method because of concerns over public relations. While the Census Bureau wanted to issue a press release announcing the Internet response option, Census Bureau staff could not agree on the wording with officials from the U.S. Department of Commerce. The press release was never issued. Nevertheless, the agency received 89,123 initial requests for online forms, and 63,053 households (169,257 persons) responded to the census using the IDC system.⁴⁸ Its limited use notwithstanding, IDC marked the first use of the Internet as a response mode for the census.

Data Capture and Processing

While in past censuses the agency used contracts with private industry to supplement its own in-house expertise or technological resources, Census 2000 was characterized by an unprecedented reliance on contractors for the development and management of the required technology infrastructure. Additionally, the agency attempted to use commercial off-the-shelf (COTS) software products—modified when necessary—for systems development.

⁴⁵ For more information on the address list development and operations see Chapter 8, “Addresses and Questionnaire Printing and Mailing.”

⁴⁶ John H. Thompson to Robert Marx, U.S. Census Bureau, “Recommendation That the Census Bureau Use Imaging Technology to Perform the Data Capture Function for the 2000 Census,” DMD Decision Memorandum No. 1, February 21, 1996 (originally issued as DMD to Director Memorandum No. 96-09); National Research Council, *The 2000 Census: Counting Under Adversity*, (Washington, DC: National Academies Press, 2004), pp. 71–95. For more information on questionnaire design see Chapter 8, “Addresses and Questionnaire Printing and Mailing” and for information on OMR and OCR see Chapter 6, “Data Capture and Processing.”

⁴⁷ For more information on TQA and IDC, see Chapter 5, “Data Collection,” and John Chesnut, “Telephone Questionnaire Assistance” Census 2000 Evaluation No. A.1.a., March 20, 2003, and Erin Whitworth, “Internet Data Collection,” Census 2000 Evaluation No. A.2.b., August 14, 2002.

⁴⁸ Whitworth, “Internet Data Collection, Final Report,” p. iii.

For Census 2000, the Census Bureau outsourced two major components of its data capture program. Lockheed Martin Mission Systems designed, developed, and maintained the Data Capture System 2000 (DCS 2000), which combined OCR and OMR to interpret responses from digital images of over 152 million returned census forms of various types and sizes.⁴⁹ TRW, Incorporated, provided staff and services for data capture, facilities management, office equipment, supplies, and office automation for three of the data capture centers (DCCs).⁵⁰

In past censuses, the Census Bureau used its film optical sensing device for input to computers (FOSDIC), which used OMR to distinguish differences in marks on microfilm page images of the questionnaires and converted the data to machine-readable code. Handwritten responses, which could not be coded in this manner, were sent to workstations where they were keyed manually. In 1990, the Census Bureau's Technical Services Division (TSD) increased the use of automated camera technology for microfilming questionnaires.

During the early 1990s, research conducted in partnership with the National Institute for Standards and Technology (NIST) and the Rochester Institute of Technology Research Corporation (RITRC) evaluated a variety of data capture technologies with particular emphasis on new OCR software. These studies contributed to TSD's development of a prototype digital imaging system combining OMR and OCR, and, where necessary, customized COTS software with agency-developed programs. During the 1995 Census Test this prototype demonstrated the feasibility of using OCR and OMR to capture data from respondent-friendly forms. Evaluations of this test also noted the technical and institutional implications of contracting the data capture program to industry.⁵¹

The successes of the 1995 Census Test, and a benefit-cost analysis favoring a digital imaging option, were behind the Census Bureau's 1996 decision to use digital imaging combined with OCR and OMR for Census 2000 data capture.⁵² It marked the first time the Census Bureau outsourced the development and deployment of this portion of its data capture program. In order to manage this change, the agency established the Decennial Systems and Contracts Management Office (DSCMO) to direct the development of system requirements and the acquisition and implementation of hardware, software, and telecommunications to support the decennial census.

Data Dissemination

Efforts to reengineer federal government operations, combined with budget cutbacks in the early 1990s, prompted the Census Bureau to seek more efficient and cost-effective methods for disseminating census data. Advances in information technology enabled the agency to combine traditional use of print media with a variety of digital media formats and distribution methods to disseminate decennial data products. The Internet provided the Census Bureau with the capability to:

- Quickly and efficiently distribute data products, such as summary files, through file transfer protocol (FTP).
- Publish reports and memoranda as portable document files (PDFs).

⁴⁹ Low-volume forms were deliberately excluded from DCS 2000 and instead keyed from paper as a risk-mitigation strategy.

⁵⁰ A fourth DCC was managed by the National Processing Center (NPC), a permanent Census Bureau facility in Jeffersonville, IN.

⁵¹ Jon Geist, "Evaluation Report for Processing Office #A85: Preparation and Preliminary Scoring of the Evaluation File for the 1995 Census Test of Image-Based Capture Technologies," October 31, 1995, p. 8, in Appendix D of U.S. Census Bureau, "Electronic Imaging and Data Capture System Prototype for the 1995 Census Test," Final Report, February 1996; Recognition Research Incorporated, "1995 Decennial Census Prototype: Final Report" (November 6, 1995) pp. 23–24 in Appendix B of U.S. Census Bureau, "Electronic Imaging and Data Capture System Prototype for the 1995 Census Test," Final Report, February 1996. For more information on the 1995 Census Test, see Chapter 2, "Planning the Census" and Chapter 6, "Data Capture and Processing."

⁵² John H. Thompson to Robert Marx, U.S. Census Bureau, "Recommendation that the Census Bureau Use Imaging Technology to Perform the Data Capture Function for the 2000 Census," DMD Decision Memorandum No. 1, February 21, 1996 (originally issued as DMD to Director Memorandum No. 96-09).

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- Make data products accessible to a host of users, from the casual Internet “surfer” to the most sophisticated “extractors” and “manipulators” of census data.⁵³

In 1997, the Census Bureau commissioned the development of an Internet-enabled information system to provide access to data from Census 2000, economic censuses and surveys, and the American Community Survey. Developed by IBM, the American FactFinder (AFF) system provides users with customizable data products, including briefs, abstracts, area profiles, economic indicators, summary data, geographic files, and maps.⁵⁴

THE LEGAL CONTEXT

Federal censuses have always had the potential to be contentious because their primary purpose is to distribute seats in the U.S. House of Representatives—and thus political power—among the states based on state populations. A series of Supreme Court decisions in the 1960s (the one-person, one-vote cases) extended the use of population censuses to the drawing of congressional district boundaries and state and local legislative districts as well. Since the 1960s, the increasing use of formulas that involve the actual or estimated population size of governmental units to distribute federal and other funds has added another source of contention.

During the first half of the 1990s, the legal context of census affairs consisted of litigation over the 1990 census and legislation to resolve perceived failures pertaining to the 1990 census in preparation for Census 2000. Toward the end of the decade, the focus shifted to litigation over Census 2000.

Resolution of 1990 Census Adjustment Litigation

The U.S. Department of Commerce considered a statistical adjustment of the 1990 census counts, but Secretary of Commerce Robert Mosbacher decided against it on July 15, 1991. Following Mosbacher’s decision, the plaintiffs⁵⁵ in the *City of New York* lawsuit returned to court, seeking an order compelling the department to adjust the census. Almost 5 years later, on March 20, 1996, the Supreme Court unanimously upheld Secretary Mosbacher’s decision not to adjust the 1990 census.⁵⁶ The Court concluded that the Secretary’s decision was “consistent with the constitutional language and the constitutional goal of equal representation”⁵⁷—the standard of review it had established in two earlier constitutional challenges to the conduct of the census.⁵⁸ However, the Supreme Court did not address either the constitutionality or legality of statistical sampling (including statistical adjustment based on sampling) to produce the state population numbers for apportionment of the U.S. House of Representatives.⁵⁹

⁵³ In December 1997, joint application development sessions were held to gather requirements from subject matter experts and potential data users in order to make the system design user-centered rather than data-centered. The interviews conducted during these sessions identified four categories of users: extractors, manipulators, profilers, and surfers. Extractors are expert users who download large amounts of raw data to conduct analyses. They are familiar with Census Bureau terminology and use Census Bureau data to perform their jobs. Manipulators are users of Census Bureau data who conduct searches and customize the output by manipulating data sets and formatting their own charts and tables. They are somewhat familiar with Census Bureau terminology and rely on speedy query functionality to build searches. Profilers are users who seek pre-packaged, easy-to-find information to answer specific questions. They accept information that is readily available and have a basic understanding of Census Bureau terminology. Surfers are casual users who visit the site out of curiosity or for nonprofessional reasons. Ease of use, entertainment, and interactivity appeal to these users. As a rule, they are not as familiar with the Census Bureau as the other users. See Titan Systems Corporation/System Resources Division and Kevin A. Shaw, Project Manager, Planning, Research, and Evaluation Division, “American FactFinder System Requirements Study, Final Report,” Census 2000 Evaluation R.3.b, June 6, 2002, and U.S. Census Bureau, “Program Master Plan: Census 2000 Decennial Dissemination and Inquiry System,” Census 2000 Informational Memorandum No. 25, December 13, 1999.

⁵⁴ For more information on the development of AFF and the dissemination of census data products, see Chapter 9, “Data Products and Dissemination.”

⁵⁵ Plaintiffs included a number of states, counties, cities (including New York), organizations, and individual citizens from participating jurisdictions.

⁵⁶ *Wisconsin v. City of New York*, 517 U.S. 1 (1996).

⁵⁷ *Ibid.*, p. 19.

⁵⁸ See *Department of Commerce v. Montana*, 503 U.S. 442 (1992), and *Franklin v. Massachusetts*, 505 U.S. 788 (1992).

⁵⁹ See the “Litigation” section of Chapter 11, “Legal Issues,” for detailed summaries of this case and the Census 2000 lawsuits.

Legislation That Set the Stage for the Census 2000 Sampling Litigation

The Clinton administration's plan to introduce new statistical sampling techniques in Census 2000 led to a protracted wrangle between the leadership of the Republican-controlled Congress and the Democrat-controlled executive branch. After much discussion, the two sides reached a compromise in P.L. 105-119, the act funding the Department of Commerce for FY 1998, which was enacted into law in November 1997. In addition to funding several executive branch departments, this legislation provided for a civil remedy to any person adversely affected by the use of an allegedly unlawful and/or unconstitutional statistical method in producing the Census 2000 apportionment or redistricting data and specifically authorized the Speaker of the House (or his designee) to bring a civil action on behalf of the House of Representatives to prevent any such use.

As noted earlier, this law established an eight-member Census Monitoring Board (with four members to be appointed by the majority leadership in Congress and four by the administration) to observe and report to Congress on all aspects of the planning for and implementation of Census 2000. The legislation amended Title 13 to allow board members access to confidential information in the course of their duties. P.L. 105-119 formally established the "dual track" planning process by requiring the Census Bureau to ". . . plan, test, and become prepared to implement a 2000 decennial census, without using statistical methods . . ." as an alternative to the original plan.⁶⁰ Finally, the law required the Census Bureau to make publicly available "the number of persons enumerated without using statistical methods" for the apportionment, redistricting, and Summary File 1 data.⁶¹

Census 2000 Litigation

While Census 2000 spawned fewer lawsuits than its two predecessors, many important census issues were litigated, including three cases decided by the Supreme Court. Much of the litigation associated with Census 2000 had to do with the issue of statistical adjustment of the census counts and related matters.

Two lawsuits filed in February 1998 (*Glavin v. Clinton* and *U.S. House of Representatives v. Department of Commerce* [as filed]) challenged the constitutionality and legality of the Census Bureau's plan to use sampling to complete nonresponse follow-up and to use the results of a sample survey (Integrated Coverage Measurement) to statistically adjust the census counts to produce a "one-number census" that corrected for net coverage error. Under the Census Bureau's original plan, these sample-produced data would have been the official data for all uses of census data, including apportionment.

In August and September 1998, district courts in the District of Columbia and Virginia, respectively, held that Section 195 of Title 13 prohibited the use of sampling to produce the apportionment counts and enjoined the Census Bureau from implementing its plan for Census 2000.

The Department of Commerce sought review of these decisions by the U.S. Supreme Court. The Supreme Court agreed to hear the cases and consolidated them for purposes of oral argument, which took place on November 30, 1998. On January 25, 1999, the Supreme Court issued its decision in *U.S. House of Representatives*, concluding that Section 195 of the Census Act (Title 13, U.S. Code) precluded the use of sampling to produce the congressional apportionment counts.⁶² Having determined its use violated Section 195 of Title 13, U.S. Code, the Court did not address the constitutionality of sampling for apportionment purposes. As is discussed in greater detail in Chapter 11, "Legal Issues," the Census Bureau subsequently revised its plan for Census 2000 so that sampling would not be used to produce the apportionment data.

On March 6, 2001, Secretary Donald Evans announced his decision to designate the unadjusted data as the official redistricting data and withhold the adjusted data. Following the Secretary's decision, the city of Los Angeles (and other plaintiffs) amended an earlier complaint, seeking a

⁶⁰ P.L. 105-119, Title II, Section 209(j).

⁶¹ *Ibid.*

⁶² *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999). Section 195 of Title 13, U.S. Code, reads as follows: "Except for the determination of population for purposes of apportionment of Representatives in Congress among the several States, the Secretary shall, if he considers it feasible, authorize the use of the statistical method known as 'sampling' in carrying out the provisions of this title."

court order releasing the adjusted data as the official redistricting data. The District Court for the Central District of California upheld the Secretary's decision not to adjust the redistricting data.⁶³ The case was ultimately decided by the U.S. Court of Appeals for the Ninth Circuit, which affirmed the district court's decision upholding the Secretary's determination.⁶⁴

Following the Secretary's decision, Accuracy and Coverage Evaluation (A.C.E.) results below the national level were not publicly released. The Census Bureau and the Department of Commerce received numerous Freedom of Information Act (FOIA) requests for the adjusted data (in most cases, at the block-level) from state and local government officials and various print media. All such FOIA requests, and subsequent administrative appeals, were denied, citing the deliberative process privilege in Exemption 5 of the FOIA. The department stated that the adjusted block-level data were "predecisional" and "deliberative" and were related to an intradepartmental recommendation not to statistically adjust the official redistricting data, a recommendation accepted by the Secretary of Commerce.

In connection with one such request, the ensuing FOIA lawsuit reached the U.S. Court of Appeals for the Ninth Circuit.⁶⁵ That court, on October 8, 2002, upheld the decision of the U.S. District Court for the District of Oregon ordering the release of the Census 2000 adjusted block-level data under the FOIA.⁶⁶ The district court had ruled that the adjusted block-level data were not protected under Exemption 5 of the FOIA as predecisional or deliberative.⁶⁷ The district court, in ruling on the case, relied on *Department of Commerce v. Assembly of California*, a FOIA lawsuit dealing with release of the 1990 census adjusted block-level data.⁶⁸ In that case, the Ninth Circuit Court ruled that the 1990 census adjusted data were neither predecisional nor deliberative. Pursuant to the October 8, 2002, Ninth Circuit Court decision, the Census Bureau released the data to the plaintiffs and, anticipating additional requests for the adjusted block-level data (given the Ninth Circuit Court decision), developed a process for providing the data to all requesters.

The State of Utah and other plaintiffs filed two lawsuits relating to Census 2000 operations/methodologies. In the first *Utah v. Evans* (known as *Evans I*, filed on January 10, 2001), Utah challenged the Census Bureau policy of including overseas federal civilian and military employees and their dependents in Census 2000 for apportionment purposes but excluding thousands of missionaries of the Church of Jesus Christ of Latter-day Saints (the LDS Church) who were temporarily serving abroad when Census 2000 was conducted. The State of Utah contended that had the overseas LDS Church missionaries been included in, or the overseas federally affiliated households excluded from, the apportionment counts, the state would have received a fourth seat in the U.S. House of Representatives.

On April 17, 2001, a three-judge panel of the U.S. District Court for the District of Utah (Central Division) upheld the Secretary of Commerce's decision (delegated to the Census Bureau) to include only federally affiliated overseas Americans in the Census 2000 apportionment counts.⁶⁹ Plaintiffs appealed to the Supreme Court, and on November 26, 2001, the Court issued a summary affirmation (that is, without hearing the case) of the judgment of the district court.⁷⁰

Utah and co-plaintiffs filed their second lawsuit—*Utah v. Evans* (*Evans II*)—on April 25, 2001. Plaintiffs alleged that had the Census Bureau not employed the use of "hot-deck" count imputation in producing the Census 2000 apportionment counts, Utah would have received one additional seat for a total of four seats in the U.S. House of Representatives.

⁶³ *City of Los Angeles v. Evans*, 2001 WL 34125617 (C.D.Cal. April 25, 2001).

⁶⁴ *City of Los Angeles v. Evans*, 307 F.3d 859 (9th Cir. 2002).

⁶⁵ The adjusted data were the subject of other lawsuits as well; these cases are discussed in the "Litigation" section of Chapter 11, "Legal Issues."

⁶⁶ *U.S. Department of Commerce v. Carter*, 307 F.3d 1084 (9th Cir. 2002).

⁶⁷ *Carter v. Department of Commerce*, 186 F.Supp.2d 1147 (D.Or. Nov. 20, 2001).

⁶⁸ *Department of Commerce v. Assembly of California*, 968 F.2d 916 (9th Cir. 1992). For a detailed summary of the case, see U.S. Bureau of the Census, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), pp. 12-12-12-13. It is worth noting that the Eleventh Circuit Court of Appeals, in *Department of Commerce v. Florida House of Representatives*, 961 F.2d 941 (11th Cir. 1992), reached the opposite conclusion, holding that the 1990 census adjusted block-level data fell within the scope of the deliberative process privilege in Exemption 5 of the FOIA, and that court therefore upheld the withholding of those data. *Ibid.*, p. 12-13.

⁶⁹ *Utah v. Evans*, 143 F.Supp.2d 1290 (D. Utah April 17, 2001).

⁷⁰ *Utah v. Evans*, *aff'd*, 534 U.S. 1038 (2001).

As in past censuses, the Census Bureau used a statistical method known as imputation to assign occupancy status (existent, residential, occupied or vacant) to addresses and, if imputed to exist, be residential and occupied, the number of occupants, if these, or any of these, could not be determined by field verification. Status, counts, and characteristics were imputed based upon the attributes of neighboring addresses for which enumerators had obtained the relevant information.

Utah claimed that count imputation was a form of statistical sampling, which—based on Section 195 of Title 13, U.S. Code—the U.S. Supreme Court held earlier in *Department of Commerce v. U.S. House of Representatives* (see above) could not be used for generating apportionment counts. Additionally, Utah claimed that the use of count imputation was in violation of the Apportionment Clause of the Constitution as amended by Section 2 of the Fourteenth Amendment.⁷¹ This case was ultimately decided by the Supreme Court, which issued a June 20, 2002, decision concluding that the use of “hot-deck” count imputation is neither contrary to the Constitution nor Section 195 of Title 13, U.S. Code.⁷²

⁷¹ The Apportionment Clause of the Constitution (Article I, Section 2, Clause 3) refers to an “actual Enumeration” to be conducted every 10 years “. . . in such Manner as . . . [Congress] shall by Law direct.”

⁷² *Utah v. Evans*, 536 U.S. 452 (2002).

Chapter 2.

Planning the Census

INTRODUCTION	27
THE 1990 CENSUS	27
Trends in Census Costs	28
The 1990 Undercount	28
Demographic Analysis	29
Post-Enumeration Survey	29
EARLY PLANNING FOR CENSUS 2000	30
Congressional Hearings and Input	31
The Government Accountability Office (GAO)	32
National Academy of Sciences Panels	33
Panel on Census Requirements in the Year 2000 and Beyond	33
Panel to Evaluate Alternative Census Methods	34
TASK FORCE FOR DESIGNING CENSUS 2000	35
CONSULTATIONS WITH DATA USERS	36
Census Advisory Committee of Professional Associations	36
Census Advisory Committees on the African American; American Indian and Alaska Native; Asian and Pacific Islander; and Hispanic Populations	37
Survey of Nonfederal Data Users	37
ALTERNATIVE DESIGNS PROGRAM FOR CENSUS 2000	38
THE PLAN FOR CENSUS 2000	41
Content of the Plan	41
Cost of the Plan	43
Reaction to the Plan	43
Opposition to Sampling	43
Concerns about specific sampling proposals for nonresponse follow-up	44
PRECENSUS 2000 TESTING	45
1992 National Census Test I	46
1992 National Census Test II	47
1993 National Census Test I	48
1993 Living Situation Survey	49
1993 National Census Test II	50
1993 Administrative Records Follow-On Survey	51
1993 National Census Test III	52
1994 Survey of American Indian and Alaska Native Government Administrative Records	53
1994 National Census Test I	54
1994 National Census Test II	55
1994 Address System Information Survey	56
1995 CENSUS TEST	56
New Sampling and Estimation Procedures	57
Sampling and estimation to correct for net-coverage error	58
New Procedures to Reduce the Undercount	59
Simplified questionnaires and multiple mail contacts	59
Improved rosters and coverage questions	60
Initial mailout of Spanish-language questionnaires	60
Increased availability of census questionnaires	60
Targeted enumeration methods	61
Service-based and special place enumeration	61
Administrative records	62
New Avenues for Greater Cooperation	62
Developing Cooperative Ventures	63
Development of a master address file (MAF)	63
U.S. Postal Service identification of vacant housing units	64

CONTENTS

New Uses of Technology	64
Advanced technologies to contact persons or to allow them to contact census offices	64
Innovative data-capture methodologies and processing systems	64
Fully automated matching	65
New methods for collecting long-form questionnaire data	65
1995 Census Test Results and Summary	65
1996 CENSUS TESTS	66
The Office of Management and Budget's Statistical Policy Directive No. 15	66
Modernizing Race and Ethnicity Categories	66
1996 National Content Survey (NCS)	67
1996 Race and Ethnic Targeted Test (RAETT)	69
RAETT Results.	71
1996 COMMUNITY CENSUS	73
Simplified Enumerator Questionnaire	73
Use of American Indian Administrative Records	74
1997 NATIONAL CENSUS TEST	75
DUAL-TRACK CENSUS PLANNING	75
THE CENSUS 2000 DRESS REHEARSAL	76
Master Address File (MAF)	77
Mailing Strategy/Response Options	79
Advertising	82
Data Collection and Field Infrastructure	83
Service-based enumeration	85
Coverage edit follow-up	85
Large household follow-up.	86
Recruiting, hiring, and training	86
Logistics	89
Data Processing.	89
Data capture	89
Within-Block Search Operation and Primary Selection Algorithm	91
Within-block search operation	91
Primary selection algorithm	91
Invalid return detection operation	92
Sampling	92
THE SUPREME COURT'S SAMPLING DECISION	96

Chapter 2: Planning the Census

INTRODUCTION

Over the past several decades it has become increasingly difficult to take the decennial census. The U.S. Census Bureau began planning for Census 2000 by reexamining nearly every aspect of its prior census operations, with the intent of making Census 2000 the most accurate population count ever. One of the most significant conclusions that emerged from the Census Bureau's assessment of the 1990 census was that the agency had pushed traditional enumeration techniques nearly to the limits of their effectiveness. For 2000, the agency sought both to enhance its traditional methods and to develop new, innovative ways to collect, process, and disseminate population and housing data. Furthermore, the 1990 census cost far more than any previous population count, even when the cost per household was adjusted for inflation. As a result, accuracy and cost concerns underlay the Census Bureau's efforts to reengineer the census.¹

The first phase of Census 2000 planning, from 1987 to 1997, was fundamentally similar to the preparations for the 1990 census. The Census Bureau organized a planning team, conducted research into new techniques and technologies, evaluated the results of the most recent census, consulted various data users for their requirements and suggestions, and began to test the new techniques that it hoped to use for the coming census. The second phase, from 1997 to 1999, is unique in census history. During this phase, the Census Bureau pursued two different planning paths (statistical sampling and traditional enumeration planning), not knowing which it would be required to use. Although each track required different methodologies, some operations were common to both. The third phase, final census planning (following the 1999 Supreme Court ruling prohibiting the use of sampling for apportioning seats in the U.S. House of Representatives), marked the period during which the Census Bureau was able to commit to a single planning track. During this phase, the Census Bureau finalized a plan that incorporated elements from both planning tracks (see Chapter 1, "The Context of Census 2000").

THE 1990 CENSUS²

Much of the planning for Census 2000 reflected dissatisfaction with the 1990 census within the Census Bureau, Congress, the data user community, and the public. In searching for ways to conduct a better census, the Census Bureau considered its options for overhauling its enumeration methodologies, promotion and outreach, automation, organization and management, and statistical methodology.

Despite criticism of its results, the 1990 census provided notable successes.³ The most prominent of these included:

- Geographic support system. The creation and implementation of a digitized geographic database called the Topologically Integrated Geographic Encoding and Referencing (TIGER®)⁴ System.
- Increased automation. The expansion of automation into field operations, the early conversion of responses on questionnaires into computer-readable files ("data capture"), and the establishment of electronic linkages between Census Bureau headquarters and more than 400 offices throughout the country.

¹ U.S. Department of Commerce, Economics and Statistics Administration, and Bureau of the Census, "The Plan for Census 2000," (April 5, 1996), p. I-1.

² See U.S. Census Bureau, *1990 Census of Population and Housing: History, Parts A-D*, 1990 CPH-R-2A-D (Washington, DC: Government Printing Office, 1993–96).

³ See Charles D. Jones, "Taking the Census: Lessons from 1990," presented at the 1991 Annual Meeting of the Population Association of America.

⁴ TIGER® is a registered trademark of the U.S. Census Bureau.

- Recruiting. The 1990 census work force peaked at about 300,000 during the spring of 1990 when the enumerators visited approximately 34.2 million addresses to collect census data from nonrespondent households.
- Outreach and promotion. A public-service media campaign and an outreach program built support networks and encouraged local and tribal governments, national and community organizations, schools and religious organizations, and private and nonprofit corporations to inform their members or constituents about the importance of participating in the census. A pro bono advertising campaign included appeals to general audiences, coupled with targeted messages addressed to several minority populations.

Trends in Census Costs

The cost of the decennial census has grown dramatically since 1970 (see Table 2-1). Based on information provided by the Census Bureau and the Government Accountability Office,⁵ the National Academy of Sciences' Panel on Census Requirements⁶ concluded that among the factors contributing to increased census costs were the growth in the number of housing units, a decline in the willingness of respondents to return completed questionnaires, and expanded demand for small-area data.

Table 2-1.
Trends in U.S. Population Size, Census Costs, and Final Response Rates:⁷ 1970 to 2000

Characteristic	Decennial census cycle			
	1970	1980	1990	2000
Full-cycle census cost (in millions of constant 2000 dollars) . . .	\$920	\$2,159	\$3,275	\$6,553
Population (in millions)	203.3	226.5	248.7	281.4
Housing units (in millions)	70.7	90.1	104.0	117.3
Final response rate (in percent)	78	75	65	67
Cost per housing unit (in constant 2000 dollars)	\$13	\$24	\$32	\$56

Source: U.S. General Accounting Office, "2000 Census: Significant Increase in Cost Per Housing Unit Compared to 1990 Census," GAO-02-31, December 2001, Table 1; U.S. Census Bureau, *Statistical Abstract of the United States: 2003* (Washington, DC: Government Printing Office, 2003), Table 1; and Herbert F. Stackhouse and Sarah Brady, Census 2000 Evaluation A.7.a. "Census 2000 Mail Response Rates." Final Report. January 30, 2003. p. 11.

The 1990 Undercount

For the first time since the Census Bureau began using postcensal surveys to evaluate census coverage following the 1950 census, evaluations of the 1990 census indicated that it had been less accurate than its immediate predecessor.⁸ Following the 1990 census, the Census Bureau used two independent methods to evaluate census coverage—demographic analysis⁹ and a post-enumeration survey. In addition to measuring overall the undercount, these studies revealed that the differential undercount for minorities persisted.

⁵ The Government Accountability Office (GAO) is the investigative arm of the Congress that audits and evaluates government programs and activities. Prior to July 7, 2004, this organization was called the General Accounting Office.

⁶ Public Law 105-135, the Decennial Census Improvement Act of 1991, mandated that the National Academy of Sciences (NAS) undertake a study of both the best means to count the nation's populace, and the most promising alternative methods for collecting other demographic and housing data. The goals of this research were to identify ways to reduce both the cost and undercount associated with the 1990 census.

⁷ The final response rate was defined as the number of questionnaires returned by mail divided by the total number of housing units that received questionnaires delivered either by the United States Postal Service or by Census Bureau staff by the end of the census year.

⁸ While the first post-enumeration survey was taken following the 1950 census, the first study of the undercount was conducted following the 1940 census. That study compared the census results to Selective Service registration numbers. See Daniel O. Price, "A Check on Under-Enumeration in the 1940 Census" *American Sociological Review*, Volume 12, Issue 1 (Feb., 1947), pp. 44–49.

⁹ Demographic analysis (DA) uses administrative records on births, deaths, migration, and Medicare to develop an independent estimate of the population. DA is a benchmark to evaluate the national population figure from the decennial census. First developed in 1955, and later improved through continued research at the Census Bureau and elsewhere, DA estimates are considered to be the standard for judging the completeness of the census count.

Demographic Analysis

Demographic analysis compares decennial census population counts with estimated population totals derived from administrative records of births, deaths, immigration, and emigration. (Undocumented immigrants are one of the most difficult demographic analysis components to estimate.) The following table indicates the net national undercount of population for the decennial censuses between 1940 and 1990.¹⁰

Table 2-2.
Demographic Analysis Estimates of the Net National Undercount Between 1940 and 1990

Census	Net national undercount	
	Millions of people	Percentage
1940	7.5	5.4
1950	6.5	4.1
1960	5.7	3.1
1970	5.7	2.7
1980	2.8	1.2
1990	4.2	1.6

The undercount was made more troubling by the continued existence of a differential undercount. “Differential undercount” is a measure of the systematic differences in the undercount rates for identifiable population groups. The net national undercount rate for African Americans in 1990 measured by demographic analysis was more than four times greater than that for all other races (5.7 percent vs. 1.3 percent). While demographic analysis can produce national undercount estimates for groups based on age and sex, it cannot provide detailed estimates for racial or ethnic groups other than African Americans and non-African Americans, nor can it provide reliable sub-national estimates.¹¹

Post-Enumeration Survey

The second method of coverage evaluation—the post-enumeration survey—allowed the Census Bureau to calculate the undercount rates for several racial and ethnic groups.

The 1990 post-enumeration survey consisted of an independent sample of nearly 172,000 housing units clustered in about 7,500 of the nearly 7 million blocks in the 50 states and the District of Columbia. Areas containing American Indian reservations and those with significant Black, Hispanic, or Asian populations were oversampled. Census Bureau field interviewers listed the post-enumeration survey sample units before Census Day (April 1, 1990), and regional census center employees visited them beginning in June 1990 to conduct interviews. Clerks in the processing offices matched the post-enumeration survey records against those from the census. Using a statistical method called “dual system estimation,” Census Bureau statisticians used post-enumeration survey data to estimate the “true” population and net undercounts for the nation and its component geographic areas. The initial post-enumeration survey estimate of undercount was 2.4 percent, but after correcting a processing error, the final post-enumeration survey derived estimates of the net national undercount by race and Hispanic origin for 1990 were as follows:

¹⁰ U.S. Census Bureau, *Report to Congress—The Plan for Census 2000* (revised August 1997), p. 2. The estimated net national undercount rate for 1990 from demographic analysis was reduced from 1.8 percent to 1.6 percent in the process of thoroughly evaluating the estimates derived from the Accuracy and Coverage Evaluation (A.C.E.) Survey, part of the Census 2000 coverage and evaluation program. See, U.S. Bureau of the Census, “Technical Assessment of A.C.E. Revision II,” March 12, 2003. Regarding the use of demographic analysis to determine national net undercount rates, see Robert E. Fay, Jeffrey S. Passel, and J. Gregory Robinson (with assistance from Charles D. Cowan), *1980 Census of Population and Housing. The Coverage of Population in the 1980 Census*. PHC80-E4 (Washington, DC: Government Printing Office, 1988).

¹¹ U.S. Census Monitoring Board, “Issue Briefs: Demographic Analysis,” December 28, 2000.

Table 2-3.

Post-Enumeration Estimates of the Net 1990 National Undercount by Race and Ethnic Group¹²

Racial/ethnic group	Percentage undercount
Total population	1.6
Non-Hispanic Whites	0.7
African Americans	4.4
Hispanics (can be any race)	5.0
Asians/Pacific Islanders	2.4
American Indians/Alaska Natives (on reservations)	12.2

The post-enumeration survey also confirmed that children and young adults were much more likely to be undercounted than older adults, and that renters, particularly those living in rural areas, were more likely to have been missed by the census than were homeowners.

EARLY PLANNING FOR CENSUS 2000¹³

In October 1987, the Census Bureau established the 21st Century Decennial Census Planning Staff. The staff identified many pressing issues that the Census Bureau would have to confront in preparing for Census 2000 and began developing and analyzing options to overcome them. The staff's mission was to:

- Begin early planning of Census 2000 based on the assumptions that a fundamental change in the census design would require substantial research, testing, and evaluation.
- Examine major trends in society, the labor force, technology, and data-user needs that might indicate a need for significant changes in methods or design for Census 2000.
- Develop and evaluate proposals for census designs that would simplify the decennial census, concentrate on constitutional requirements, expand subnational demographic and housing data collected outside of the basic decennial census, and release those data to the public faster and more efficiently.

The staff prepared a number of working papers and research reports, hired organizations such as the National Institutes of Standards and Technology (NIST) and the Oak Ridge National Laboratory to investigate technological issues relating to data collection and capture, presented papers at professional meetings, and conducted a number of off-site conferences of senior Census Bureau staff at which proposals were presented and discussed and directions for future research were decided.

One of the staff's early reports¹⁴ identified alternative census designs that incorporated key components of what became the Census Bureau's initial plan for conducting Census 2000:

- Sampling for nonresponse follow-up.
- Incorporating information contained in a variety of administrative records into the decennial census and related programs.
- Maintaining and updating of a computerized address list throughout the decade.

¹² Howard Hogan, "The 1990 Post-Enumeration Survey: An Overview," *The American Statistician*, 1992, pp. 261–69. Howard Hogan and Gregg Robinson, "What the Census Bureau's Coverage Evaluation Programs Tell Us About Differential Undercount," 1993 Research Conference on Undercounted Ethnic Populations, Richmond, VA, May 5–7, 1993.

¹³ Much of the material in this section is based on Sandra Rowland, "Early Planning—21st Century Decennial Census Planning Staff Research," 2010 Decennial Census Management Memorandum No. 97-5, March 12, 1997.

¹⁴ U.S. Bureau of the Census, "Year Zero Analysis Team Report," unpublished paper, September 23, 1988.

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- Creating and maintaining a continuously updated master address file (MAF), linked to the Census Bureau's Topologically Integrated Geographic Encoding and Referencing (TIGER®) system, which also served as a sampling frame for Census 2000 and for intercensal surveys.¹⁵

In conjunction with subject-matter specialists, the Census Bureau investigated options for expanding the agency's intercensal program of collecting, processing, and releasing subnational demographic and housing data.¹⁶ To compare the estimated costs of alternative census designs, the staff commissioned studies of alternative cost-modeling methods, modified the 1990 census cost model (that allowed managers in the field to estimate the cost and personnel implications of changes in staffing plans), and created an early version of what became the Census 2000 cost model.¹⁷ Staff members investigated alternatives to the 1990 method of "capturing" census data. The staff contracted with the NIST to assess the potential of optical mark and character recognition and image processing as a data-capture methodology for Census 2000. The NIST report's conclusions were sufficiently promising to persuade the Census Bureau to continue to evaluate newer versions of this technology.¹⁸

After reviewing the relevant literature, the 21st Century Staff prepared an analysis of societal trends that might require significant changes in the methods and procedures the Census Bureau would use to conduct decennial censuses in 2000 and beyond.¹⁹ Among the trends the group singled out for continued monitoring and analysis were:

- Declining public cooperation and mail response.
- Labor force constraints.
- Declining federal budgets.
- Demand for improved census coverage.

This review of trends that might affect census taking in the twenty-first century served as the basis for a series of Census Bureau staff meetings in December 1990. These meetings introduced over 100 Census Bureau employees to the research regarding potential designs for Census 2000 and represented an effort to encourage an acceptance of significant changes in major Census Bureau programs on the part of key agency staff.

In November 1990, the Census Bureau received funding for research and development on design changes for Census 2000. This funding allowed the creation of the Year 2000 Research and Development Staff and the formation of a Task Force for Designing the Year 2000 Census and Census Related Activities for 2000–2009 to begin technical and policy work on design changes for the next census.²⁰

Congressional Hearings and Input

In the early 1990s, the Census Bureau heard repeatedly from some in Congress that Census 2000 should be redesigned to improve accuracy and reduce costs. Beginning with the 102nd Congress (1991–1992), the Census Bureau's oversight and appropriations subcommittees held a number of

¹⁵ See, for example, Memorandum from Robert W. Marx, "Creation and Maintenance of a Census Bureau Master Address List—Issues Summary," December 7, 1988.

¹⁶ See, for example, Roger Herriot, Bruce Johnson, and Sandra Rowland, "21st Century Decennial Census Planning: A Vision for Meeting Future Needs," a paper presented at the Joint Advisory Committee meeting of the Census Advisory Committees on Population Statistics and of the American Statistical Association, April 13, 1989. An earlier paper introduced a number of the themes the 21st Century Census Staff explored. See Roger Herriot, David V. Bateman, and William F. McCarthy, "ISAS—Integrated System of Area Statistics—A New Approach for Meeting the Nation's Needs for Sub-National Data," March 9, 1988 (draft). Components of the ISAS became the basis for the development of the Continuous Measurement program.

¹⁷ Bruce E. Tonn, Richard Goeltz, and Ho-Ling Hwang, "Alternative Approaches to the Year 2000 Census," Oak Ridge National Laboratory, December 8, 1988, and Bruce E. Tonn, "Approaches to Estimating Costs for the Year 2000 Census," Oak Ridge National Laboratory, undated.

¹⁸ Sandra Rowland, "Early Planning—21st Century Decennial Census Planning Staff Research," 2010 Decennial Census Management Memorandum No. 97-5, March 12, 1997.

¹⁹ U.S. Bureau of the Census, "Deep Currents: The Case for Change in Decennial Censuses," unpublished paper, May 1990.

²⁰ Susan Miskura, "Forward from 1990: Designing the 2000 Census," Proceedings of the Survey Research Methods Section, American Statistical Association, 1992, p. 38.

hearings to evaluate the results of the 1990 census and consider various means of improving upon the 1990 methodology to achieve a more accurate census in 2000. The first oversight hearing was held by the House of Representatives' Subcommittee on Census and Population in February 1991. Chairman Tom Sawyer (D-OH) noted concerns about the quality of the 1990 count, referring to the "vulnerabilities of traditional counting methods."²¹

At an August 1, 1991, hearing, Chairman Sawyer stated that the challenge for 2000 ". . . will be to maintain a credible process and to overcome the historic problems that diminished the accuracy of the 1990 census,"²² and recommended legislation authorizing a comprehensive study of census methods by the National Academy of Sciences (NAS).

That legislation was enacted into law (October 1993), and required the Secretary of Commerce to contract with the NAS to study ways for the government both to achieve the most accurate population count possible and to collect other demographic and housing data. Specifically, the law required the NAS to consider: (1) ways to improve the government's enumeration methods; (2) alternative methods for collecting the data needed for a basic population count, including the use of administrative records; and (3) the appropriateness of using sampling methods, in combination with basic data-collection techniques or otherwise, in the acquisition or refinement of population data.

The law also mandated that the NAS issue a final report, within 3 years, that evaluated the relative advantages and disadvantages and provided an analysis of the cost effectiveness, of each alternative.²³

The Government Accountability Office (GAO)²⁴

In June 1992, the GAO released its comprehensive evaluation of the 1990 census, which discussed lessons learned and identified opportunities for fundamental, effective reforms. Among its conclusions, the report determined that the Census Bureau's mailout/mailback methodology, used since the 1970 census, had outgrown its utility. The GAO doubted that mail response rates in 2000 would improve much over those for 1990 and argued that the continued use of this methodology would increase the census' overall and differential net undercounts.

In its review of a draft version of the report, the Census Bureau commented that:

[The] report focuses largely on cost minimization as the criterion for the Census 2000 design. While we agree that cost is a major factor to consider, we believe the Administration and Congress need to balance costs with other goals in designing the next census. Other goals to consider include (but are not limited to) completeness of the counts, differential coverage rates, data needs, . . . public burden, operational feasibility, and timeliness.²⁵

The GAO responded by stating that the cost of the census is not measured solely in terms of dollars spent. Furthermore, reduced data quality (including the failure to make reductions in the overall and differential net undercounts), "also is a cost of the current approach to taking the census . . . Thus, a less costly census would be one that saves money and improves data quality."²⁶

²¹ U.S. House of Representatives, Subcommittee on Census and Population, House Committee on Post Office and Civil Service, February 21, 1991, Hearing, opening written statement of Rep. Sawyer.

²² U.S. House of Representatives, Subcommittee on Census and Population, Committee on Post Office and Civil Service, August 1, 1991, "Hearing to Review Major Alternatives for the Census in the Year 2000," opening written statement of Rep. Sawyer.

²³ See the section titled "Public Laws Concerning Census 2000" in Chapter 11, "Legal Issues" for a more detailed discussion of the legislation authorizing the National Academy of Sciences study.

²⁴ On July 7, 2004, the name of this organization changed from the General Accounting Office to the Government Accountability Office. Throughout the text of this publication, the latter name will be used. However, citations of publications, papers, and other sources will use whatever organizational name was in use at the time the source was created.

²⁵ May 14, 1992, letter from Barbara E. Bryant, Director, Bureau of the Census, to Richard L. Fogel, Assistant Comptroller General, General Accounting Office.

²⁶ U.S. General Accounting Office, "Decennial Census: 1990 Results Show Need for Fundamental Reform," GGD 9294, June 9, 1992, p. 62.

The report contained detailed cost and data-quality information and demonstrated that as the mail response rate decreased, the number of persons missed or erroneously included in the census increased. The GAO concluded that:

the results from 1990 demonstrate that adding more resources is unlikely to allow the Bureau to enumerate that last remaining segment of the population. Furthermore, the series of field operations that attempt to count the last portion of the population are among the most costly components of the census in terms of both resources expended and errors introduced into the count.²⁷

The GAO recommended that the Census Bureau “rigorously explore” using statistical sampling for some portion—or even all—of the nonresponse workload to “reduce dependence on costly field follow-up operations in order to improve the next census.”²⁸

National Academy of Sciences Panels

Public Law 102-135, the Decennial Census Improvement Act of 1991, mandated that the National Academy of Sciences (NAS) undertake a study of both the best means to count the nation’s population, and the most promising alternative methods for collecting other demographic and housing data. The goals of this research were to identify ways to reduce both the cost and undercount associated with the 1990 census.

To conduct the research, the Committee on National Statistics of the National Research Council established two panels.²⁹ The Panel on Census Requirements in the Year 2000 and Beyond was responsible for studying the cost structure of the census, ways to achieve the most accurate population count, and requirements for census content. The panel issued an interim report in May 1993 and a later report in November 1993. Its final report, *Modernizing the U.S. Census*, was published in 1995.³⁰ The Panel to Evaluate Alternative Census Methods focused on technical issues regarding implementation and evaluation of promising methodologies. Its research was to complement that of the Panel on Census Requirements in the Year 2000 and Beyond. The Panel to Evaluate Alternative Census methods released its final report, *Counting People in the Information Age*, in 1994.³¹

Panel on Census Requirements in the Year 2000 and Beyond. The panel worked closely with Census Bureau staff to understand the cost structure of the census and the reasons for cost escalation since 1970. It also modeled the likely cost implications of several proposed changes to census methodology, including radical changes, such as conducting a sample census and basing the census entirely on administrative records. The panel met with a wide range of data-user groups to understand their requirements and uses of census data, conducted two case studies of census data use (one for transportation research and planning and the other for housing research and planning), investigated the legal requirements for reapportionment and redistricting data, and studied data needs of federal agencies.

This panel reached four general conclusions, from which most of its more specific recommendations were derived:³²

- It was fruitless to try to count every person with traditional census methods of physical enumeration. Simply spending more money to extend use of traditional methods would not improve coverage or data quality.

²⁷ Ibid., p. 49.

²⁸ Ibid., p. 50.

²⁹ The National Research Council was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the National Academy of Sciences’ purposes of furthering knowledge and advising the federal government. The National Research Council members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The National Academy of Sciences has a Congressional mandate granted to it in 1863 that requires it to advise the federal government on scientific and technical matters.

³⁰ Barry Edmonston and Charles Schultze (eds.), *Modernizing the U.S. Census* (Washington, DC: National Academy Press, 1995). See also, *Planning the Decennial Census: Interim Report* (Washington, DC: National Academy Press, 1993).

³¹ Duane L. Steffey and Norman M. Bradburn (eds.), *Counting People in the Information Age* (Washington, DC: National Academy Press, 1994).

³² See Edmonston and Schultze (eds.), *Modernizing the U.S. Census*.

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- It was possible to improve the accuracy of the census count with statistical estimates of the number and characteristics of those not directly enumerated.
 - A thorough review and reengineering of census procedures and operations could achieve substantial cost savings in the next census, even as accuracy was being improved.
 - Continuous measurement deserved serious consideration as a means of providing more frequent small-area data; however, the necessary research and evaluation could not be completed in time for Census 2000. Therefore, Census 2000 should include the long-form questionnaire.

Panel to Evaluate Alternative Census Methods. Unlike the Panel on Census Requirements in the Year 2000 and Beyond, the Panel to Evaluate Alternative Census Methods focused on how the census should be taken. The panel included members with expertise in statistics, survey methods and design, decennial census operations, field organization of large-scale data collection, demography, geography, marketing research, administrative records and record linkage, small-area statistics, and respondent behavior.

The panel conducted much of its work through four working groups that were formed to consider different aspects of alternative census design. The first group examined response and coverage issues and reviewed research on methods to improve census response while reducing differential under-coverage. Topics studied by the group included questionnaire design and implementation, census rostering, and residence rules. The second group examined how sampling and statistical estimation methods might improve coverage and reduce differential under-coverage. The third working group studied current and potential uses of administrative records in censuses and considered related factors such as cost and public reaction to new uses of administrative records. The fourth group studied continuous measurement and matrix sampling, two alternative methods for collecting the detailed socioeconomic data that have been gathered on the decennial census' long-form questionnaire.

In September 1993, the panel presented an interim report outlining its findings and conclusions to date, many of which concerned plans for the 1995 Census Test.³³ Its overarching concern was that the design alternatives to be tested for Census 2000 should consider the “cost, yield, and gross error” of each method in order to determine the cost-benefit balance of each. The panel praised the Census Bureau's post-1990 census research, especially its efforts to improve response and coverage, and the agency's intention to expand its use of sampling and estimation.

In 1994, the panel's final report made 41 recommendations covering 5 basic concerns—census design, response and coverage, sampling and statistical estimation, administrative records, and alternatives for collecting long-form questionnaire data.³⁴ The Census Bureau adopted many of the recommendations, including map improvement efforts, address-list sharing among agencies, studies of administrative records as vehicles to collect census data, and expanded use of foreign language materials. The panel also endorsed the Census Bureau's efforts to pursue continuous measurement and to find alternatives to collecting long-form questionnaire data.

In terms of redesigning the census, the most significant recommendation that both NAS panels made was to encourage the Census Bureau to expand its use of statistical sampling so as to improve coverage and reduce costs. This recommendation meshed well with what the Census Bureau was hearing from many of those who criticized the results of the 1990 census and wanted a less costly and more accurate census in 2000. With pressure from Congress and the GAO to redesign the census, and with the support of its own staff, the NAS, and much of the statistical community, the Census Bureau set about designing a census that could be adjusted based on modern statistical sampling.

³³ *A Census That Mirrors America: Interim Report* (Washington, DC: National Academy Press, 1993).

³⁴ For a comprehensive list of the recommendations and the rationale for them, see Steffey and Bradburn (eds.), *Counting People in the Information Age*.

TASK FORCE FOR DESIGNING CENSUS 2000³⁵

In November 1990, the Census Bureau and its parent agency, the Department of Commerce, formed the Task Force for Planning the Year 2000 Census and Census-Related Activities for 2000–2009. The task force was directed to consider lessons learned from the 1990 census, technical and policy issues, constitutional and statutory mandates, changes in U.S. society since earlier decennial censuses, and the most current knowledge of statistical and social measurement. These considerations were then to be applied to census-related activities for the period 2000 through 2009.³⁶ The task force also had the authority to contract with the National Academy of Sciences and others, as appropriate, for additional expertise and insights. The task force was required to make its final recommendations by January 1, 1995, and disband following submission of the report.

The task force was divided into three committees: the Technical Committee, the Policy Committee, and the 2000 Census Advisory Committee. The Technical and Policy Committees reported to both the Census Bureau and the Department of Commerce. The 2000 Census Advisory Committee was charged with identifying and communicating to the Secretary of Commerce the concerns of federal and nonfederal government, and nongovernment stakeholders regarding the Census 2000 design.

The task force committees held numerous policy and technical discussions that allowed members to debate and question alternative ways to design a modern census that took into account recent changes in society while fulfilling the Census Bureau's constitutional duties. The task force committees were asked to study a number of issues, including the use of administrative records, statutory requirements for data, methods to improve public participation, new partnerships with governments at all levels, mechanisms to spread data collection over longer periods, ways to tailor data collection efforts for different groups, and improved cost control and estimation methods. To aid the task force in accomplishing these goals, the Census Bureau provided it with information on the research and experimentation program of the 1990 census, the experience of the 1990 census itself, and trends identified by the Census Bureau's Year 2000 Research and Development staff.

The Technical Committee, drawn from senior technical staff from the Census Bureau and other federal statistical agencies, was responsible for evaluating the technical feasibility of design alternatives.³⁷ The committee identified key research questions, formulated test objectives, and evaluated research findings. It was chaired by the associate director for statistical design, methodology, and standards at the Census Bureau and supported by the Year 2000 Research and Development Staff. Responsibility for designing Census 2000, conducting related activities for the subsequent decade, and the research and experimentation program efforts, was placed under the direct supervision of the Technical Committee of the task force.

The Technical Committee developed 14 different alternative decennial census designs in an effort to improve the response rate and reduce the differential undercount.³⁸ Stakeholders were consulted about the merits of each of these designs. Though no single alternative could, by itself, solve these two problems, the designs identified useful methodologies that could be tested for use in Census 2000.

The Policy Committee was drawn from Census Bureau staff, other federal agencies with significant decennial census data needs, the Department of Commerce's Office of Administration and Office of Legislative and Intergovernmental Affairs, and the Office of Management and Budget (OMB). It was chaired by the U.S. Department of Commerce deputy assistant secretary for statistical affairs of the Economics and Statistics Administration.

³⁵ Ibid., pp. 38–39.

³⁶ U.S. General Accounting Office, "Lessons Learned for Planning a More Cost-Effective 2010 Census," GAO 03-40, October 2002. p. 5.

³⁷ These agencies included the National Institute of Standards and Technology, the Bureau of Labor Statistics, the Internal Revenue Service, and the National Center for Health Statistics. See U.S. Census Bureau, "Reinventing the Census: Global Report of the Task Force for Planning the Year 2000 Census," April 1995.

³⁸ See U.S. Census Bureau, Year 2000 Research and Development Staff, "2000 Census Research and Development Alternative Designs Program," June 1992.

The Policy Committee's primary responsibilities were the content development and data collection processes. It examined the questions that the Census Bureau was compelled to ask by statute, and explored whether some of those data (particularly small-area economic and housing data) could be gathered in some other manner, such as continuous measurement, matrix sampling, and/or administrative records.

The Advisory Committee (later rechartered and renamed the Census 2000 Advisory Committee)³⁹ was responsible for communicating to the Secretary of Commerce the concerns of various stakeholders, such as private citizens, other levels of government, national and community-based organizations, academia, and private industry. It was composed of representatives from various organizations with an interest in decennial census accuracy and small-area data, as well as representatives of the U.S. Postal Service and both houses of Congress. The committee was chaired by the executive director of the Council of Professional Associations on Federal Statistics. (After the committee's creation, the Secretary of Commerce renewed its charter in 1995 and again in 1997. The Policy and Technical Committees disbanded when their charter ended on July 15, 1995.)

During its tenure, the Advisory Committee moved beyond the evaluation of the Census Bureau's statistical methods to consider nonstatistical issues such as outreach and promotion, and cooperative ventures with state, local, and tribal governments (this later was renamed the Partnership Program). In March 1995, the Advisory Committee submitted its final recommendations to the Secretary of Commerce. The committee's recommendations were based on its inquiries into decennial census methodologies and how they might be refined and revised. The committee members concluded that the Census Bureau should:

- Increase outreach and promotion efforts to stimulate participation and reduce the differential undercount, rather than simply raise awareness.
- Involve tribal, state, and local governments in census planning, development, implementation, and evaluation by forming partnerships with them.
- Test sampling and estimation techniques for nonresponding households to determine if these could help the Census Bureau contain costs and reduce the differential undercount.
- Maintain the long-form questionnaire as a method to collect small-area demographic, social, and economic data. Also, test 1990 questionnaire content to determine what changes, if any, should be made to the 2000 questionnaire. The Census Bureau also should consider nonfederal data needs.
- Ensure that census tests are scheduled early enough to take advantage of their findings in the final census design for 2000. Other research, particularly that from the 1990 census, also should be used to help create the final design.

CONSULTATIONS WITH DATA USERS

Census Advisory Committee of Professional Associations

As the nation's largest data-collection agency, the Census Bureau continued to seek advice from outside sources on census and survey planning. The main purpose for establishing and maintaining advisory committees was to obtain the expert advice of private sector representatives from the academic, business, and statistical communities on the full range of Census Bureau programs and activities. In 1994, the Secretary of Commerce, with the concurrence of the General Services Administration, established the Census Advisory Committee of Professional Associations pursuant to the Federal Advisory Committee Act. This committee consisted of members of the four separate, preexisting Census Bureau advisory committees: (1) The Census Advisory Committee of the

³⁹ The Department of Commerce granted the Advisory Committee's request that its charter be extended beyond the original January 1995 deadline. Following Census 2000, its charter was changed to allow the committee to help the Census Bureau prepare for the 2010 Census and the American Community Survey. It was renamed to reflect its status as an ongoing committee, becoming "The Decennial Census Advisory Committee."

American Statistical Association (ASA); (2) The Census Advisory Committee of the American Marketing Association (AMA); (3) The Census Advisory Committee of the American Economic Association (AEA); and (4) The Census Advisory Committee of the Population Association of America (PAA).

This advisory committee consisted of 36 members—nine members from each of the four organizations mentioned above. Members served 3-year terms and could be reappointed to second terms. The committee met twice a year, usually in the spring and fall.⁴⁰

Census Advisory Committees on the African American; American Indian and Alaska Native; Asian and Pacific Islander; and Hispanic Populations

The Census Advisory Committees on the African American; American Indian and Alaska Native; Asian and Pacific Islander; and Hispanic Populations were established in 1985 for the 1990 decennial census.⁴¹ The charters for the committees expired in 1992; however in February 1994, the Secretary of Commerce reestablished the committees for Census 2000.⁴² The Census Bureau requested membership nominations from its stakeholders, Congress, Census Bureau employees, and others. Committee members were usually community leaders, academicians, social science researchers, planners and developers, entrepreneurs, educators, and other private sector data users from national, regional, and local organizations. The committees reported to the Director of the Census Bureau and met at least once a year.

The primary objective of the committees was to seek advice and recommendations on special methods of enumeration and the race and ethnicity questions during the design, planning, and implementation phases of Census 2000, and promoting and obtaining cooperation and participation in Census 2000. Some of the issues that the committees addressed included whether to include a multiracial question on the long form, whether to use administrative records to collect census data, and how to disseminate the data to racial and ethnic populations. The committees held their first meeting in December 1994.⁴³

Survey of Nonfederal Data Users

As part of the content development process for Census 2000, the Census Bureau assessed the needs of nonfederal data users by conducting the “Survey of Census Needs of Non-Federal Data Users” (NFDU). The NFDU survey, mailed to approximately 18,000 participants between November 1994 and March 1995, collected information on the subject needs, uses of specific items (including the statutory citation where applicable), and the level of geographic detail that nonfederal data users needed for the 43 topics that appeared on the 1990 census questionnaires.

Survey respondents were asked whether they used each of the required or programmatic topics for any of the following six uses:

- Compliance with federal statute
- Application for federal funds and/or grants
- Meeting requirements of state or local legislation
- Program and/or policy development
- Analysis and/or program/policy evaluation
- Other (court rulings/orders, marketing, etc.)

⁴⁰ For a comprehensive review of the committee’s discussions and recommendations and the Census Bureau’s responses, see *Minutes and Report of Committee Recommendations*, published after each meeting.

⁴¹ Also known as the Race and Ethnic Advisory Committees (REAC).

⁴² In July 1999, the Native Hawaiian and Other Pacific Islander (NHOPI) subcommittee of the Asian and Pacific Islander Committee was created. The following February, the NHOPI subcommittee was chartered as a separate committee and the Asian and Pacific Islander Committee was renamed the Asian Committee.

⁴³ For a comprehensive review of the committees’ discussions and recommendations, see *Minutes and Report of Committee Recommendations*, published after each meeting.

From the approximately 9,000 completed questionnaires that NFDU survey participants returned during the solicitation period, the Census Bureau concluded that:

- All the topics collected on the 1990 questionnaires were needed.
- The largest single user for each topic was local governments, which also was the largest single group of survey respondents.
- There was widespread interest in small-area data (census tract level or below) for all topics, demonstrating one of the most essential uses of decennial census data.
- The census sample was the only source of complete social, economic, and housing information for these small areas, towns, and ZIP Code tabulation areas (for 2000).
- Program and policy development and evaluation were the top two uses for every topic. The data suggested that program planning and evaluation often were carried out to comply with federal or state statutes or to apply for federal funds.
- Data needs could not be met from alternative sources (administrative records, surveys, etc.) at the lowest geographic level and with the cross-tabulations needed.

The findings of the NFDU survey were incorporated into the Census Bureau's discussion on Census 2000 testing and ultimately the census' questionnaire content.⁴⁴ (See Chapter 3, "Population and Housing Questions.")

ALTERNATIVE DESIGNS PROGRAM FOR CENSUS 2000

The first major goal of the Census Bureau's Research and Development Program for Census 2000 was to identify and describe a full range of design alternatives to accomplish the major features of a census. The Census Bureau's Task Force for Planning the Year 2000 Census was responsible for overseeing the development of alternative designs. In order to determine which of the several research options for alternative designs to pursue, Census Bureau officials sought advice from the decennial census' many stakeholders. Between February and November 1991, the Year 2000 Research and Development Staff (Y2K Staff) and the Task Force for Planning the Year 2000 Census held a series of focus group meetings with stakeholders representing hundreds of organizations to begin exploring the idea of fundamental change in the census of population and housing. Each of the groups was asked to imagine the economic, technological, and social environment that likely would exist in 2000 (for example, increasing racial, ethnic, and language diversity of the population and increasing reluctance to comply with government requests for information). Given the environment described, each group was then asked to consider what fundamental changes to the census would be necessary to accommodate that environment.

The Y2K Staff defined which "building blocks" were necessary for taking a census. For each, the Y2K Staff considered how the Census Bureau had done each of these operations in the past and how they might be done differently in the future. Using these building blocks, the Technical Committee of the task force created 14 alternative decennial census designs. The Technical Committee was intimately involved in helping the Y2K Staff to establish a research and development agenda; the Technical Committee helped design and evaluate numerous projects, while the Y2K Staff managed and documented them.⁴⁵ The Technical Committee discussed each option with its stakeholders and developed research questions related to each design. It organized a series of more than 25 meetings with groups of stakeholders, called "Alternative Design Assessment Meetings" (ADAMs), and met between February and June 1992. In November 1992, the Y2K Staff issued "Criteria for Evaluating Alternative Census Designs," which documented the results of the ADAMs workshops to rank or weight the criteria to be used in deciding among the alternative designs.

⁴⁴ U.S. Census Bureau, "Surveying Non-Federal Data Users for Census 2000 Needs," 1995.

⁴⁵ See U.S. Census Bureau Research and Development Staff, "Alternative Designs Program," June 1992, especially Appendix 2, "Designs Analysis and Cooperative Ventures."

Six of the fourteen alternative designs for Census 2000 that the Census Bureau submitted to the OMB for review were variations on the 1990 census:

- Multiple response options. Added response options such as telephone, computer, fax, and interactive cable television to the mailout/mailback method that required respondents to complete and return paper questionnaires.
- High tech. Combined multiple response options with the use of administrative records and statistical estimation.
- Expanded content. Would collect additional data by using a variety of long-form questionnaires.
- Truncated/more estimation. Limited nonresponse follow-up (NRFU) among nonrespondents to the initial census questionnaire, allowing for substantial cost savings and requiring sampling and estimation to complete NRFU.
- Sample census. Would expand the use of statistical sampling to the entire mailout universe; all census counts would be sample-based estimates.
- Target enumeration barriers. Census-taking methods primarily designed for hard-to-reach populations.

Two of the proposed Census 2000 designs replaced traditional census-taking methods with reliance on administrative records as the only or primary source of data:

- Administrative records only. The census would be taken using administrative records⁴⁶ only. No direct enumeration would take place and no census questionnaire would be used.
- Administrative records with enumeration support. The census would be based on the data in administrative records, supplemented by enumeration and follow-up with respondents for whom few or no other records existed.

Four designs involved the collection of minimal data on each inhabitant of the United States:

- Voting rights data only. Similar to the methods using administrative records, but involving only the collection of data required by the Voting Rights Act (i.e., number of persons by age, race, and Hispanic origin at the block level).
- Reapportionment and redistricting counts only. Would collect only reapportionment and redistricting data—a basic headcount for each block. This design would collect less data than previous censuses, but would include statistical “adjustment” for over and undercounts.
- Redistricting counts only/no estimation. This basic headcount would collect and publish block-level population counts to meet redistricting requirements; it would incorporate neither coverage-improvement operations nor statistical “adjustment” of the counts.
- Reapportionment only/no estimation. This “bare bones” headcount would tabulate and publish population counts for states only and would not include procedures for coverage-improvement or statistical adjustment.

Two designs envisioned data collection taking place at two or more separate times during the collection period:

- Two-stage. One-hundred percent (short-form) data collected on Census Day. Sample data would be collected later in the year.
- Continuous measurement. Ongoing data collection throughout the decade. Minimal data would be collected in 2000.

⁴⁶ Administrative records are collected as a result of legal or regulatory requirements or transactions; are a result of program operations rather than intentional data collection; and are typically collected without regard to their analytic use.

The ADAMs helped to determine which research questions from the 14 design alternatives to pursue and how to test them. The subsequent research aided the Y2K Staff in developing its Design Alternative Recommendations (DARs). Though none of the 14 alternatives alone addressed all concerns, many of them did contain important elements that warranted further study. The research projects leading up to the creation of the DARs examined such topics as response rate improvement, potential uses of administrative records, methods for dealing with special populations, and new uses of technology.

The DARs were released initially in May 1993 and later reworked and re-released in July 1993 following public comment. At that point, the Census Bureau published a *Federal Register* notice containing the final design assessment criteria—six mandatory and ten desirable.⁴⁷ The six mandatory criteria stipulated that the final census plan would:

- Not require a constitutional amendment.
- Meet data requirements for reapportionment.
- Provide data defined by law and past practice for state redistricting.
- Provide age and race/ethnic data needed to enforce the Voting Rights Act.
- Protect the confidentiality of respondents.
- Include provisions to reduce the differential undercount.

The task force's research and development program ended in 1995. The task force believed that in order to have enough time to refine its suggestions into a concrete plan, the research for any significant change for Census 2000 needed to be complete and ready for examination in the 1995 Census Test. The results of its investigations into alternative methods for taking a census led the task force to endorse several means for improving the results of Census 2000. It supported:

- New avenues for greater involvement of stakeholders, such as building partnerships.
- New procedures to reduce the differential undercount, such as simpler forms.
- New uses of technology to capture the data more efficiently.
- Increasing the use of statistical methods to reduce the differential undercount.
- Using new methods for collecting long-form data.

The key question, however, was how effective these changes would be in meeting the Census Bureau's goals for Census 2000—increasing response rates, reducing the differential undercount, and containing costs.

In February 1994, the Y2K Staff issued the “1995 Census Test Design Plan.” The Y2K Staff used the five new proposed methods for improving census results to create 15 specific proposals that could be tested and evaluated in the 1995 Census Test.⁴⁸

The Alternative Designs Program guided the Census Bureau's early research and development agenda. It had primary responsibility for directing the selection, design, and evaluation of the research efforts that were used to determine what form the census redesign should take. The purpose of the 1995 Census Test was to determine how best to implement these designs so that they would work together as part of an integrated, functioning decennial census design.

⁴⁷ *Federal Register* notice from July 20, 1993. Many of these were based on the response to a *Federal Register* notice from March 1993, which had solicited public input about the designs and criteria for assessing them.

⁴⁸ See also Task Force for Designing the Year 2000 Census and Census-Related Activities for 2001–2009, “Reinventing the Census: Global Report of the Task Force for Planning the Year 2000 Census,” April 1995.

Table 2-4.
Fundamental Changes and the 1995 Census Test⁴⁹

Fundamental changes from 1990	Major goals	
	Reduce differential undercount	Reduce cost
New Uses of Sampling and Estimation		
Use sampling and estimation procedures to reduce the differential undercount and the cost of the census.	X	X
New Procedures to Count the Undercounted		
Use an easy-to-fill-out questionnaire with multiple mail contacts to improve response.		X
Use new coverage questions to ensure a complete listing of household members.	X	
Mail Spanish-language questionnaires to areas with large concentrations of Spanish-speaking households.	X	X
Make census questionnaires available at convenient locations for those who did not receive a questionnaire or believe they were not counted.	X	
Use special targeted methods to count historically undercounted populations and geographic areas.	X	
For counting people with no usual residence, use a method that counts people at the facilities where homeless people obtain services.	X	
Study various ways that administrative records can be used to identify people who otherwise would be missed in the census.		X
New Avenues for Greater Involvement		
Develop cooperative ventures with other federal agencies; state, local, American Indian tribal, and Alaska Native village governments; and private and nonprofit organizations to form partnerships in taking the census.	X	X
Evaluate initial efforts to complete and maintain an address list and geographic files in cooperation with the U.S. Postal Service and state, local, American Indian tribal, and Alaska Native village governments.	X	X
The U.S. Postal Service will identify vacant housing units or mistakes on the address list. ...		X
New Uses of Technology		
Develop a new data capture system using electronic imaging.		X
Use fully-automated matching to improve census coverage.	X	
New Method for Collecting Long-Form Data		
Experiment with collecting sample (long-form) data using multiple sample forms.		X

THE PLAN FOR CENSUS 2000

On February 28, 1996, at a ceremony in the main hall of the Department of Commerce's Hoover Building, key stakeholders and Commerce and Census Bureau officials released, "The Plan for Census 2000."⁵⁰ Special guests invited to present and discuss each of the four main strategies underlying the plan included Commerce Secretary Ron Brown, Office of Management and Budget Director Alice Rivlin, Commerce Under Secretary for Economic Affairs Everett Ehrlich, and Census Bureau Director Martha Farnsworth Riche. To generate interest in, knowledge about, and discussion of plans for Census 2000, ten roll-out presentations were made in the cities throughout the United States in the following months.⁵¹

Content of the Plan

"The Plan for Census 2000," as originally presented in 1996, laid out the key objectives and strategies for taking the census. The key objectives were to:

- Make every effort to include every person.
- Implement an open process.

⁴⁹ "Summary of Objectives for the 1995 Census Test," prepared by Y2K, March 1994.

⁵⁰ Bureau of the Census, "The Plan for Census 2000," a revised version incorporating some suggestions from several sources was released on April 5, 1996.

⁵¹ From April through September 1996, roll-out presentations of the plan were held in Chicago, Los Angeles, Atlanta, Boston, New York, Seattle, San Francisco, Sacramento, Denver, and Kansas City.

-
- Eliminate the differential undercount.
 - Produce a “one-number census.”⁵²

This plan was guided by four key strategies for taking Census 2000: (1) build partnerships at every stage of the process, (2) keep it simple, (3) use technology intelligently, and (4) use statistical methods. The use of statistical methods, particularly the increased use of statistical sampling, generated the most interest and was the most controversial of the four strategies.⁵³ These four strategies guided the Census Bureau’s development of its plans to conduct Census 2000 and helped to establish which elements of the plan needed to be further tested.

The first strategy, partnership building at each stage of the process, was an attempt by the Census Bureau both to increase awareness of the census and to reach population groups that had been undercounted in prior years. The agency hoped that an effective partnership program would help reduce the number of missed households and avoid needless duplication of efforts to find people. The Census Bureau sought to build partnerships with governmental entities at all levels and community groups, as most of these would have better knowledge of their area’s population groups. Representatives from these governments and community groups could recommend corrections to the maps and address lists the Census Bureau produced,⁵⁴ suggest the best locations for placing forms, and advise on how to advertise to each area’s subpopulations. The Census Bureau also partnered (as a result of legislation, P.L. 30-430) with the U.S. Postal Service in order to take advantage of that agency’s address lists; such a partnership would help the Census Bureau avoid duplicating the postal service’s work and also avoid the costs associated with such duplication. Finally, the Census Bureau hoped to use contracts with private sector partners to secure such services as facilities management, advertising and promotion, and human resources.

The second strategy, keeping the census simple for respondents, was intended to increase the accuracy and reduce the cost of the census by increasing voluntary participation and mailback response rates. The Census Bureau sought to make its forms easy to read, attractive, and easy to fill out. To create these new “user-friendly” forms, the Census Bureau believed that it should hire private marketing experts. Another strategy to make answering the census easier was to initiate multiple contacts with respondents by sending a notification letter, the census questionnaire, and a reminder letter. Finally, the Census Bureau proposed increasing the number of ways that people could respond by making forms available at stores, malls, schools, civic and community centers, and other places. People also would be able to dial a toll-free number in order to have an additional questionnaire mailed to them.

The third strategy, using technology intelligently, was intended to make the census faster to process, less costly, and more accurate through technological innovation. Technology would reduce manual data entry errors and prevent double-counting, while also reducing the demand for labor and decreasing publication costs (by relying on electronic data dissemination). The Census Bureau would use digital technology to “capture” the data from the completed paper forms, rather than rely on microfilming and keypunching. Scanning data directly into a computer database, including handwritten data which would be captured by “intelligent character recognition” software, would speed the data capture process. In addition, using “matching” software to detect duplicate forms from the same address would reduce the incidence of double counting. The third main technological innovation, “point and click” tabulation, would improve data retrieval and dissemination for users.

⁵² The “one-number census” planned for Census 2000 would have been an official count of the population that integrated results of the conventional counting techniques with results from probability sampling techniques.

⁵³ The commitment to use statistical methods was modified following the Supreme Court’s January 1999 decision that ruled that Section 195 of Title 13 (the statutory authority for the census) precluded the use of statistical sampling to produce the apportionment counts.

⁵⁴ This process, known as Local Update of Census Addresses (LUCA) program (or the Address List Review Program), was a partnership program that allowed the Census Bureau to benefit from local knowledge in developing its master address file (MAF). The LUCA program was made possible by the Census Address List Improvement Act of 1994 (Public Law 103-430), which authorizes designated representatives of local and tribal governments to review the MAF and allows the local participants to appeal final Census Bureau decisions.

The fourth strategy, using statistical methods, promised to solve the problem of the differential undercount while reducing the enumeration costs associated with efforts to find the most resistant respondents. Reliance on statistical methods would allow the Census Bureau to reduce the number of temporary offices and cut the number of enumerators needed for return visits while producing a “one-number census.” Statistical methods had been used to collect data for several decades (for example, the long form, and census accuracy checks), but the Census Bureau had not generated official population figures based on statistical adjustment. While the Census Bureau’s Director believed that the 1990 census should have been statistically adjusted, the Secretary of Commerce decided against adjustment.⁵⁵ As a result of a better understanding of the 1990 population data, better planning for Census 2000, the Census Bureau again urged the use of statistical adjustment in 2000. By conducting a census using traditional methods and comparing those figures with sample-based estimates, the Census Bureau could then calculate statistically corrected population totals for each state and for the nation as a whole.⁵⁶

Cost of the Plan

At the time the plan was announced, the Census Bureau estimated its cost to be \$3.9 billion—nearly \$1 billion less than if the 1990 census procedures and methodologies were repeated (\$4.8 billion) and if it did not include any planned improvements or sampling.⁵⁷ The Census Bureau also projected that the effort to conduct Census 2000 using statistical methods would reduce the number of “staff years” to 63,718, from a projected 103,034 if 1990 methods were repeated.⁵⁸

Reaction to the Plan

Reaction to the plan among technical advisors and the professional statistical community and media reports covering the regional roll-outs was generally positive. However, there were significant criticisms of the plan, particularly from Congress. The central issue concerning the Congress was the Census Bureau’s proposed use of statistical sampling, including its intention to reduce the level of nonresponse follow-up. These concerns about sampling ran the gamut from those who opposed all sampling to those who opposed the specific sampling operations that the Census Bureau intended to use.

Opposition to Sampling

Some members of Congress believed that the Census Bureau’s plan to use statistical sampling, as contained in “The Plan For Census 2000,” violated the Constitution and/or the agency’s operating statute, Title 13, U.S. Code, and opposed any use of sampling to determine the population figures for apportionment or redistricting.

The day after “The Plan for Census 2000” was presented to the House Government Reform and Oversight Committee (February 29, 1996), Chairman William Clinger (R-PA) and Representative Bill Zeff (R-NH), who chaired the Subcommittee on National Security, International Affairs, and Criminal Justice (which had jurisdiction over the census), expressed reservations about the use of sampling. Several witnesses spoke out against the plan to use sampling, including three members of the Wisconsin delegation—Senator Herbert Kohl (D) and Representatives Thomas Barrett (D) and Thomas Petri (R). Wisconsin would have lost a seat in Congress had the 1990 census been adjusted. Governor Thomas Ridge (R-PA) registered his opposition to sampling (in written testimony), claiming that as a result of a computing error, his state also would have lost a seat if the 1990 census had been adjusted. Former Census Bureau Director Bruce Chapman, who headed the agency from 1981 to 1983, also spoke against sampling.

⁵⁵ Bryant, *Moving Power and Money*, pp.156–59.

⁵⁶ In January 1999, the Supreme Court determined that existing laws did not allow for the Census Bureau to adjust the population figures for apportionment. For more on how this altered the Census Bureau’s plans to use statistical sampling in Census 2000, see below and Chapter 11, “Legal Issues.”

⁵⁷ By April 1997, the estimated cost of the census had increased very slightly to \$4.0 billion. This increase came from the fall 1996 decision to control sampling at the census tract level rather than the county level.

⁵⁸ “The Plan for Census 2000,” p. IV–1.

Sampling plans were defended by Drs. Charles Schultze and James Trussell, chair and member, respectively, of the NAS Panel on Census Requirements in the Year 2000 and Beyond. Both had contributed to the panel's report, *Modernizing the U.S. Census*, which had been instrumental in encouraging the Census Bureau to use sampling methodologies to complete data collection and adjust the census.

Following this hearing, sampling opponents sought to bar the Census Bureau from pursuing its plan to use statistical sampling to adjust the census. In June 1996, legislation was introduced that would have amended Section 141 of Title 13, U.S. Code, to prohibit the use of sampling or other statistical procedures in determining the state population totals for the purpose of apportionment;⁵⁹ however, no action was taken on the bill.

In August 1996, the Senate Appropriations Committee filed a report on the FY 1997 Commerce Department appropriations bill that contained a recommendation to curtail the Census Bureau's sampling activities. It stated that the "increase provided here is for activities which will position the Census Bureau to be ready to move forward with a plan for Census 2000 once one is approved by Congress. Until then, the committee directs that activities be limited to those which are critical to this effort, and that no funds be spent on preparation for a plan using statistical sampling."⁶⁰ The full Senate never acted on the Commerce Department's original appropriations bill, so this language was not approved by the full Senate. Similar language was not included in the conference report for the omnibus funding bill that eventually included the FY 1997 appropriation for the Commerce Department.

On September 18, 1996, the newly reorganized House Committee on Government Reform and Oversight adopted, on a 22 to 12 vote, largely along party lines, a freestanding (not associated with any piece of legislation) report that opposed the Census Bureau's plans to use sampling in Census 2000 for purposes of determining the apportionment counts. Concerns raised about sampling in the report, bitterly divided along partisan lines, included the apparent subjectivity of decisions about the methodology, legal uncertainties, undermining of public confidence, accuracy of small-area data, and the complexity of sampling techniques. The report also included views of the minority that strongly supported sampling. The minority views stated that "the outright rejection of sampling and adjustment, without any proposal for achieving the dual charge of Congress of a more accurate and less expensive census, is untenable."⁶¹

Concerns about specific sampling proposals for nonresponse follow-up. The Census Bureau's plan, announced in February 1996, called for making energetic efforts to count everyone by mail or telephone. If the mail and telephone enumeration attempts did not reach a 90 percent completion rate for a county, then census enumerators would conduct personal visits to housing units until the targeted 90 percent level was reached. After reaching the target, the remaining 10 percent of the housing units and their inhabitants would be enumerated on a sample basis. A 1-in-10 sample of the remaining housing units would be canvassed, and the results would be used to estimate the number of nonrespondents and their characteristics.

As early as May 1995, concerns had been expressed by members of the Census Bureau's Race and Ethnic Advisory Committees (particularly members of the African American Advisory Committee) that targeting 90 percent completion at the county level would mean that some hard-to-enumerate areas with large minority populations within counties would reach substantially less than the 90 percent level. The Census Advisory Committee on the African American Population recommended that the 90 percent target be set for cities, at least for predominantly African American communities.⁶² Discussions between the Census Bureau and the advisory committees on this topic continued at the meetings in the fall of 1995.

⁵⁹ H.R. 3589, "Census, Title 13 U.S.C., Amendment."

⁶⁰ Senate Report 104-353, which accompanied H.R. 3814, "1997 Appropriations for the Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies" was filed by the Senate Committee on Appropriations on August 27, 1996.

⁶¹ House Report 104-821, "Sampling and Statistical Adjustment in the Decennial Census: Fundamental Flaws," was issued by the committee on September 24, 1996.

⁶² Bureau of the Census, *Minutes and Report of Committee Recommendations*, Census Advisory Committees on the African American, American Indian and Alaska Native, Asian and Pacific Islander, and Hispanic Populations, May 11–12, 1995, p. 92.

In September 1996, having completed discussions with its advisory committees, the Census Bureau announced that it would change its plan to target 90 percent completion at the census tract level, and estimated that this would add about \$100 million to the estimated cost of the census (from \$3.9 billion to \$4.0 billion).

In May 1996, legislation supporting the census tract-level sampling control was introduced. (See Chapter 11, “Legal Issues,” for a discussion.)

PRECENSUS 2000 TESTING⁶³

The Census Bureau routinely carried out precensus tests of operations and procedures and of questionnaire content and format. Prompted by concern about the decline in mail response between the 1970 and 1990 censuses, the Census Bureau began its testing activities for Census 2000 much earlier in the decade than for previous censuses. Earlier testing was needed to allow time to study major reforms in census questionnaire and mailout design, especially on ways to increase the willingness and ability of households to respond to the decennial census (see Table 2-5).

Table 2-5.
Tests for Census 2000

Test	Test topic	Date
1992 National Census Test I: Simplified Questionnaire Test	Mail response rates	April 1, 1992
1992 National Census Test II: Implementation Test	Mail response rates	October 1, 1992
1993 National Census Test I: Mail and Telephone Mode Test	Impact on participation rate of adding a telephone response option	April 3, 1993
1993 Living Situation Survey	Within-household coverage	May 1–August 6, 1993
1993 National Census Test II: Appeals and Long-Form Experiment	Mail response rates	July 17, 1993
1993 Administrative Records Follow-on Survey	Use of Administrative Records for follow-up activities	February and May 1993
1993 National Census Test III: Spanish Forms Availability Test	Impact on mail response of mailing Spanish-language forms to housing units in targeted areas	October 23, 1993
1994 Survey of American Indian and Alaska Native Government Administrative Records	Use of American Indian and Alaska Native administrative records for coverage improvement	1994
1994 National Census Test I: Coverage Test	Within-household coverage	January 29, 1994
1994 National Census Test II	Telephone nonresponse follow-up test	March 1994
1994 Address System Information Survey	Proportion of non-city-style addresses in U.S. and likelihood of change before 2000	September 1994

⁶³ Additional surveys concerning privacy, administrative records, etc., were conducted by third parties (colleges, universities, and other data users). These surveys are not discussed in this history, though the Census Bureau may have consulted the results during its Census 2000 planning.

Table 2-5.
Tests for Census 2000—Con.

Test	Test topic	Date
1995 Census Test	New uses of sampling and estimation; new procedures to reduce the undercount; new avenues for greater cooperation; new uses of technology; and new methods for collecting long-form data	Many components throughout 1995
1996 National Content Survey	Tested response to race and ethnicity questions conforming to proposed changes to Directive No. 15 (including multiracial category)	March–May, 1996
1996 Race and Ethnic Targeted Test	Reporting of more than one race; sequencing of race and Hispanic-origin questions; effects of collecting race, Hispanic origin, and ancestry information in a combined, two-part question; and use of alternative terminology, classifications, and formats in the race question	June 1996
1996 Community Census	Tested the simplified enumerator questionnaire (proposed for Census 2000 nonresponse follow-up operations) and the use of American Indian administrative records to augment the Integrated Coverage Measurement (ICM) procedures	October 1996
1997 National Census Test	Effect of icons and benefit messages on response; questionnaire binding (fold-out and booklet short-form); removal of roster on long-form questionnaire; use of an official and a marketing envelope	Cancelled July 1997
Census 2000 Dress Rehearsal	Tested all operations planned for Census 2000	April–July, 1998

1992 National Census Test I⁶⁴

The Census 2000 testing cycle began in April 1992 with the National Census Test I (also referred to as the Simplified Questionnaire Test)—the first in a series of four tests⁶⁵ in the Questionnaire Simplification Research Program designed to explore ways to improve mail response rates. By design, these experiments were linked conceptually to one another so that some of their results could be cumulated across experiments.

The Simplified Questionnaire Test was conducted to determine if form length, respondent-friendly form construction, a multiple mailing strategy, or requesting social security number would influence mail response. This test was a mailout/mailback survey consisting of a national sample of 17,000 housing units. The sample was divided equally into two strata: a hard-to-enumerate stratum, consisting of the reporting areas of the 67 district offices with the lowest mail-response rates in 1990, and a stratum of the rest of the United States with higher response rates. Each stratum had five panels, reflecting the four treatments plus one control panel (the 1990 short-form questionnaire). There was no field follow-up of nonresponding households.

The Simplified Questionnaire Test included multiple mail contacts with respondents, an approach that had been shown in previous research to boost response. In addition to the mailout questionnaire, all households received an advance notice letter a few days before the mailout advising them that their census form would be sent soon, followed by the questionnaire, and then a thank you/reminder postcard a few days later which thanked respondents for returning their census form and reminded those who had not returned the form to do so. Three weeks after the initial questionnaire mailout, nonresponding households were sent a replacement questionnaire.

⁶⁴ Susan Miskura, "The 1992 National Census Test (SQT) Project Overview," December 10, 1991.

⁶⁵ The four tests were the Simplified Questionnaire Test (spring 1992), the Implementation Test (fall 1992), the Mail and Telephone Mode Test (spring 1993), and the Appeals and Long-Form Experiment (summer 1993).

There were five short-form questionnaires—one control form (the 1990 census form updated to 1992) and four experimental forms of various lengths. The experimental questionnaires all incorporated respondent-friendly design features, including a larger, easier-to-read font (compared with the 1990 census forms); strong visual contrast (using color and shading) between the questions and answer boxes to make it easier to identify the correct space in which to write the answer; a clear set of instructions printed directly on the form instead of in a separate guide; and a questionnaire that grouped all questions for one person together in one space instead of in the row-column format that had been used in many previous censuses.

The mail completion rate was used in this study to measure mail response. This term is defined as the number of questionnaires returned by mail divided by the number of questionnaires mailed out minus the postmaster returns for undeliverable questionnaires. The completion rate does not imply anything about the number of questions answered or left blank on the form. This test found that:

- Asking fewer questions improved mail completion rates nationally and in areas that had higher response rates in 1990, but did not improve rates for areas that experienced low response in 1990.
- Using a respondent-friendly form improved completion rates nationally and for low response areas, but had no significant effect on the rates for higher response areas.
- The combination of fewer questions and a respondent-friendly form improved completion rates for all areas.
- The form that asked respondents for their social security number had a lower completion rate than the similar form without the question at the national level and in low response areas.
- Sending a replacement questionnaire raised completion rates for all areas and for all form versions.

The 1992 Simplified Questionnaire Test results suggested that response rates could be improved by using a coordinated mail treatment strategy that increased the number of mail contacts with respondents. Since the same contacts were used for all Simplified Questionnaire Test treatments, the effects of the individual factors could not be evaluated.

1992 National Census Test II⁶⁶

The 1992 National Census Test II, or Implementation Test, was conducted in fall 1992 to assess the relative contributions to mail-response rates of components of a mail implementation strategy. This test was designed to assess the effects on mail response of two mail components—an advance notice letter and a thank you/reminder postcard. Also included in the test design was a test for the effect of including a stamped return envelope (versus a business reply) with the mail-out questionnaire. The performance of these three variables on mail response would be measured singly and in combination.

The Implementation Test was a mailout/mailback national sample survey of 50,000 housing units. As had been done during the Simplified Questionnaire Test, the sample was divided evenly between two strata consisting of low response and high response areas in the 1990 census. Within each stratum, the sample was allocated equally to eight panels reflecting all possible combinations of the three test components: none (control), advance notice letter only, stamped return envelope only, reminder postcard only, letter plus stamped return, stamped return plus reminder, letter plus reminder, and letter plus stamped return plus reminder. No nonresponse follow-up operation was conducted for this test.

The Implementation Test used a respondent-friendly short-form questionnaire that had been used in the Simplified Questionnaire Test. The same questionnaire was used in each of the eight mailing options. No replacement questionnaire was used in this test so that its effects could be compared

⁶⁶ John H. Thompson, U.S. Census Bureau, “Evaluation Plan of the Implementation Test (IT),” September 14, 1992.

with the results from the Simplified Questionnaire Test, which did have the replacement (as well as the notification letter and reminder postcard). This procedure allowed the Census Bureau to isolate the effects that a replacement questionnaire would have on completion rates.

Conclusions drawn from the Implementation Test included:

- Both the advance notice letter and reminder postcard used individually improved mail completion rates at the national level as well as in the 1990 high and low response areas. No significant improvements were noted for the stamped return envelope at either the national or stratum level.
- Respondents receiving the advance notice letter and reminder postcard displayed higher completion rates than those receiving only the letter or the reminder.
- The replacement questionnaire improved completion rates nationally and in both the high and low response areas. Completion rates for the Implementation Test panel that used the same questionnaire version and mail components (excepting the replacement questionnaire) were significantly lower than those for the Simplified Questionnaire Test.

1993 National Census Test I⁶⁷

The 1993 National Census Test I, or Mail and Telephone Mode Test, was conducted in the spring to determine whether response rates could be increased by offering the telephone as a response option in addition to the traditional mail questionnaire. This test was prompted by the decline in census response rates, the increasing costs of conducting personal interviews for nonresponse follow-up, and the desire to be responsive to the growing interest in alternative methods for responding to the census. This test had three primary objectives: (1) to assess the public's preference for responding to a national census test by mail or telephone, (2) to determine whether overall response rates could be improved by offering a telephone option as a response mode, and (3) to measure the effect on the quality of responses when submitted by telephone.

The test was a national sample survey of 21,500 housing units. As with the Simplified Questionnaire Test and the Implementation Test, the Mail and Telephone Mode Test sample was divided into two strata: one consisting of households from low mail-response areas to the 1990 census and the second consisting of households from higher response areas. The two strata were allocated evenly among five treatment groups. A user-friendly short-form questionnaire (with the same content as the 1990 census short-form) used in the Simplified Questionnaire Test was used for all five panels. Each of the groups also received an advance notice letter, an initial questionnaire, and a reminder postcard. Three groups also received a targeted replacement questionnaire for nonresponding households. Panel 1 served as the control and was not offered the telephone response option. Panel 2 was invited to respond by telephone on one mail component (the reminder card); panel 3 had the option to use the telephone on two components; panel 4 had the option on three components; and panel 5 had the option for all four mailing components. The test did not have a nonresponse follow-up operation. A mailout/mailback or telephone-response methodology was used to collect the data. Telephone responses via a toll-free number were handled at the Census Bureau's Tucson, AZ, Telephone Center, with census interviewers using computer-assisted telephone interviewing (CATI) technology.

The main conclusions of this study were:

- Offering the option to respond by telephone did not improve response rates. It appeared that people who would have responded by mail simply substituted the telephone as a response mode.
- Although overall response was not increased, people who chose to respond by telephone had a lower item-nonresponse rate on average than those who responded by mail, possibly because of the interaction with a trained interviewer who could provide assistance in completing the

⁶⁷ Kirsten West, U.S. Census Bureau, "1993 National Census Test: Mail and Telephone Mode Response Evaluation Final Report," July 21, 1993.

questionnaire. However, questions on monthly rent and value of home had higher item-nonresponse rates, possibly because some respondents may have been hesitant to provide information perceived as sensitive in a telephone interview.

- When offered the choice of responding by mail or by telephone, most respondents preferred mail.

1993 Living Situation Survey⁶⁸

The 1993 Living Situation Survey was conducted between May and August as part of a larger program to investigate within-household coverage gains that might be obtained by simplifying the census residence rules and redesigning the household roster. The decennial census enumerated individuals at their usual residence, which was defined as the place where they lived and slept most of the time. To help respondents determine where they should be counted, especially those who lived in unusual living arrangements, the Census Bureau developed a set of residence rules. Guidelines based on the residence rules were placed on the census questionnaire to aid respondents in completing the household roster. The Living Situation Survey was designed to help the Census Bureau develop better household roster and screener questions and to help detect people who otherwise would be missed due to respondent confusion over whom to include in the household. The results were intended to help the Census Bureau improve coverage of undercounted populations, particularly minorities and renters.

The survey contained 13 additional roster questions and was designed to identify as many individuals connected to an address as possible. Respondents were asked to list individuals who stayed in the household the previous night, lived there but did not stay the previous night, and lived or stayed there during the 3- to 4-month reference period but had moved out. They also were asked to list people who ate there frequently, had a key, contributed money to the household, received mail or telephone messages, and so forth (even if such people did not stay at the household overnight during the reference period). Household respondents also were asked whether people on the roster were “usual residents” or “not usual residents.”

The Living Situation Survey was designed to examine the extent to which people lived at more than one residence, had no permanent residence, or experienced temporary mobility into and out of a residence, and to detect other situations that might result in complex and irregular household structures. Unusual living situations, such as these, have led respondents to make errors when trying to apply the residence rules. As a result, people have been associated with the wrong address or missed completely, leading to enumeration errors and undercoverage.

The Living Situation Survey was conducted for the Census Bureau by the Research Triangle Institute. The survey used a national sample of 1,000 households, with oversampling of minority populations and renters. Data were collected at both the household and individual levels through personal and telephone interviews. At the household level, respondents answered 13 questions to provide an inclusive roster of persons who were present at the address during the reference period (varying between 2 and 3 months). Individual interviews were conducted with all persons in 10 percent of the households in the survey. In addition, selected individuals in other households were interviewed to determine their status. These extra interviews targeted people identified as having a greater-than-casual attachment to the household but who stayed away for 8 or more nights during the reference period, college students, and those without a usual residence. In all, about 1,200 individual interviews were completed.

Three related questionnaires were developed for the Living Situation Survey; two for households and one for individuals. One household questionnaire contained the 13 roster questions and several others designed to determine a household respondent's personal definition of usual residence, household membership, and permanent address. The second household questionnaire included questions about an individual's connection with other residences, names and types of

⁶⁸ Elizabeth M. Sweet, U.S. Census Bureau, “Roster Research from the Living Situation Survey,” March 1994.

places stayed overnight, and reasons for leaving. The individual-level questionnaire asked respondents for their place(s) of residence for the previous 3 months and their assessment of which place, if any, they considered to be their primary place of attachment.

The primary findings of the Living Situation Survey were:

- The first two roster questions, “Who stayed here last night?” and “Who lives here but didn’t stay here last night?” identified nearly all of the usual residents. However, these queries also identified persons who were not usual residents. To use these questions for their maximum benefit the Census Bureau would need to add a “screening” question to prevent respondents from including persons on the roster in violation of census residence rules.
- The other 11 supplemental questions identified a very small proportion of usual residents but did find a large number of persons who were not usual residents.
- Analysis of verbatim responses from individual interviews indicated that people associated the term “live” with the words “permanent” and “home,” while they associated the word “stay” with the words “temporary” and “not home.” The terms “usual residence” and “household” were not used naturally by respondents even when these terms were defined repeatedly throughout the interview.
- If census residence terms and categories are not changed, the Census Bureau will have to find a way to bridge the gap between the Census Bureau’s terms and categories and those used naturally by respondents.

1993 National Census Test II⁶⁹

The 1993 National Census Test II, or the Appeals and Long-Form Experiment, was conducted in July and was the culminating experiment in the series of four tests to study ways to improve mail response. The experiment was divided into two parts to study two different issues. The first component, which used a short-form questionnaire, tested the effectiveness of two types of motivational appeals that urged respondents to participate. The second component, which used the long-form questionnaire, tested alternative respondent-friendly designs.

The 1993 National Census Test II was a mailout/mailback survey of a sample of 45,000 housing units nationwide. As in the previous three tests, the sample was divided evenly between two strata consisting of low response areas and high response areas from the 1990 census. There was no field follow-up for nonresponse. Each stratum was divided into nine treatment groups, six for the appeals portion of the test, and three for the long-form portion. All treatment groups received the full mail implementation strategy—an advance notice letter, initial questionnaire, reminder postcard, and a replacement questionnaire for nonrespondents to the initial form.

The appeals portion of the test, like the previous three tests, studied ways to increase the response rate by using variations of the short form. The test’s objective was to compare the response rates elicited by two different appeals. The first emphasized the mandatory nature of the census, while the second emphasized the benefits of the census and its confidentiality. This short-form appeals component of the test consisted of one control and five experimental treatment groups. The questionnaires used the two basic appeals (mandatory versus benefits), both singularly and in combination, and employed two different confidentiality assurances (regular versus strong). The mandatory appeal emphasized the statutory requirement for completing and returning the questionnaire, while the benefits appeal described the important uses of the census. The confidentiality statement comparisons included the standard version and a longer, more emphatic version. The various messages were placed either on the outgoing envelope of the questionnaire mailing package or as a separate insert within the mailing package. The control had no mandatory message on the envelope and did not include an insert. All six panels, including the control, used a version of the respondent-friendly short form tested in the Simplified Questionnaire Test.

⁶⁹ James B. Treat, U.S. Census Bureau, “1993 National Census Test Appeals and Long-Form Experiment Appeals or Short-Form Component: Final Report,” October 1993.

The long-form component of the test was designed to study the relative response rates for two different structural options—a separate, individual space answer format versus a row-column answer format. This test used three response groups, one control and two experimental, each of which received a different questionnaire. The first experimental questionnaire grouped all questions for each household member in one space, which had been found effective for past short forms. The other experimental design enhanced the traditional “row-column” answer format by placing the questions vertically down the left hand side of the page and the names of household members horizontally across the top.

All treatment groups in the long-form component shared the same 1990 census content; however, the control group used the 1990 census design, while the experimental questionnaires incorporated various respondent-friendly design/layout features that had improved response in earlier tests using short forms.

The Appeals and Long-Form Experiment found that:

- Placing the message, “Your Response is Required By Law” on the outgoing envelope improved completion rates at the national level and in both the 1990 census high and low response areas.
- In contrast, neither the full benefits message nor varying the confidentiality emphasis showed any measurable improvement in completion rates.
- Using the individual space design resulted in significant improvement in completion rates overall and in the 1990 higher response areas. However, the forms with this design had a greater incidence of nonresponse to the housing items located in the back section of the questionnaire that were to be answered once per household. Over 10 percent of the individual space long forms had no entries in the housing section, compared with only 1 percent for the control long form.

1993 Administrative Records Follow-On Survey⁷⁰

The 1993 Administrative Records Follow-On Survey was conducted in Godfrey, IL, in February 1993, and South Tucson, AZ, in May 1993 following special censuses taken at each location. This test was designed to assess the feasibility of using administrative records files in conjunction with enumeration records to measure overlaps and improve coverage. The test also provided Census Bureau personnel with the experience they would need had the agency decided to use administrative records on a national scale.

For the first test in Godfrey, IL, the Census Bureau used voter registration records, school records, and (on a limited basis) the town’s tax assessment records.⁷¹ The later South Tucson, AZ, test added the U.S. West Marketing Resource Database, the Arizona Aging and Adult Administration Home and Community Database file, and the Southwest Gas Company customer account file.⁷²

Following completion of each special census, the Census Bureau matched administrative records to census returns to determine if coverage and content gain could be achieved using the administrative records files. Questionnaires from the two special censuses were computer-matched, pairing administrative records to a returned questionnaire.

In Godfrey, IL, computer matching was able to pair 15,764 of the 16,271 questionnaires to administrative records. In South Tucson, AZ, 5,127 of the 5,702 returned questionnaires were matched to administrative records. Entries within the administrative records that could not be matched by

⁷⁰ Robert D. Tortora, U.S. Census Bureau, “Special Census/Administrative Records Test for Godfrey, Illinois,” August 7, 1992.

⁷¹ The Census Bureau initially planned to use food stamp recipient records following deliberations with the Food and Nutritional Service. Although privacy issues were resolved, the Census Bureau did not receive permission to use the records in time for the Godfrey, IL, test.

⁷² For the South Tucson, AZ, test, two types of administrative records were used. “Person-based” records (i.e., the voter registration, Tucson Unified School District enrollment, and U.S. West Marketing Resource files) specifically named a resident within the administrative records. The remaining records (i.e., the Southwest Gas Company customer account, U.S. West Marketing Resource Database, and the Pima County tax assessment list) provided addresses within South Tucson’s city limits to determine if housing units were absent from the Census Bureau’s own address list.

computer were reviewed manually by clerks. Entries from the administrative records that could not be matched to a questionnaire by machine or by manual review were deemed as candidates for potential coverage gain, for which a sample was chosen for follow-up evaluation.

Follow-up evaluation did not necessarily result in increased coverage; however, additions that were substantiated by personal visits indicated that the potential for a substantial coverage gain could be achieved (as demonstrated in Godfrey and South Tucson) if replicated on a national scale.

Despite the potential for increasing coverage, several stumbling blocks were identified following the survey. Use of administrative records may increase coverage of hard-to-count populations, but their use may also overcount census participants with more than one personal identifier (i.e., John Doe and J. Doe). Nationally this problem would be compounded—the undercount of some populations would decrease, but other populations would be overcounted, especially among census participants owning property at more than one address.

The Administrative Records Follow-On Survey also demonstrated that administrative records did not always account for all additions and deletions to the population and number of housing units. During personal follow-up visits in South Tucson, field staff found additional housing units and individuals who were missing from both the census address list and the administrative records. In such instances, administrative records would not directly improve census coverage, but might assist in targeting areas that need special attention by field staff during follow-up operations.

1993 National Census Test III⁷³

Language was identified as a major barrier to enumeration in the 1990 census for a number of population groups. The 1993 National Census Test III, also called the Spanish Forms Availability Test, was conducted in October to study ways to improve census mailback response by targeting areas with a significant concentration of non-English speaking Hispanics. (In the 1980 and 1990 censuses, Spanish-language questionnaires were available to respondents who called and requested them and at Questionnaire Assistance Centers, but they had never been included as part of the initial mailout.)

The Spanish Forms Availability Test was a mailout/mailback survey of 24,000 housing units and the sample was divided into two strata. The first stratum consisted of areas of the country in which 15 to 30 percent of the households were linguistically isolated and Spanish-speaking.⁷⁴ The second stratum consisted of areas in which more than 30 percent of the housing units were linguistically isolated and Spanish-speaking.

Each stratum was divided into three treatment groups: a control (respondents were mailed an English-language questionnaire only), dual (respondents were mailed both an English-language questionnaire and a Spanish-language questionnaire), and bilingual (respondents were mailed one questionnaire with Spanish and English back-to-back). All groups received an advance notice letter, initial questionnaire package, reminder postcard, and a replacement questionnaire to nonresponding households.

A telephone debriefing interview was conducted with a sample of persons who returned a form to assess the reaction of Hispanics and non-Hispanics to receiving a Spanish-language form. In all, 3,402 interviews were completed between October and December 1993.

The Spanish Forms Availability Test mailout survey found that:

- Mailing a Spanish-language questionnaire (whether as a separate or a bilingual form) significantly improved mail completion rates to the targeted areas in which 30 percent or more of the housing units were classified as linguistically isolated, Spanish-speaking. There was no evidence that inclusion of the Spanish-language questionnaire improved mail response in the other test areas.

⁷³ Manuel de la Puente and Peter Wobus, U.S. Census Bureau, "Final Report of Results from Item Nonresponse Analysis for the Spanish Language Forms Availability Test," February 1995.

⁷⁴ For this test, a linguistically isolated household was defined from 1990 census records as one in which Spanish was spoken and none of the residents age 14 or over spoke only English or spoke English very well.

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- Neither of the two Spanish-language experimental treatments—the bilingual form or the dual form—significantly outperformed the other in improving mail response.

The telephone debriefing interview found that about 48 percent of Hispanic interviewees said that receiving a Spanish-language form was a “good idea” or said that they “did not think anything of it,” versus 38 percent of non-Hispanic interviewees. However, 12 percent of non-Hispanics said that it was a “bad idea,” compared with 1.3 percent of Hispanics.

1994 Survey of American Indian and Alaska Native Government Administrative Records

The 1994 Survey of American Indian and Alaska Native Government Administrative Records was developed to determine if use of the records maintained by the American Indian and Alaska Native governments could increase coverage in Census 2000.

A pretest was conducted prior to this survey in May 1994. The Census Bureau chose a number of tribal governments to participate in the pretest, based on the size of their American Indian/Alaska Native populations, geographic location, known use of computerized record keeping, and the type of government body (traditional government or Alaska Native Regional Corporations). The pretest was undertaken to:

- Determine if the questionnaire was clear.
- Determine if any of the questions placed an undue burden on respondents.
- Estimate item refusal rates.
- Determine the length of time required to complete and mail back the questionnaire booklet.

Following the pretest, 569 survey of American Indian and Alaska Native questionnaire packets were mailed on September 26, 1994. These packets included the questionnaire, a personalized cover letter addressed to each tribal leader, and an enclosure providing answers to questions concerning the study.

A follow-up of nonrespondent governments was made November 1, 1994. Follow-up mailings were sent both to tribal leaders and enrollment offices. The Census Bureau selected governments to receive follow-up mailings based upon each tribe’s interest in having its administrative records used for improving census coverage, the regional location of the tribal governments, and the number of members represented by the tribe’s government. Governments that had not responded to the initial mailout or follow-up by November 18, 1994, received a telephone call.

In all, 234 questionnaires (40.4 percent) were returned. The response rate for the lower 48 states (49.8 percent) was higher than that for Alaska (27.6 percent). Response rates increased according to the size of the tribe’s enrollment. American Indian and Alaska Native governments representing 5,000 or more members had an average response rate of 83.8 percent. Governments representing 500 members or less had an average response rate of 44.4 percent. Responses from Alaska Native governments averaged 57.1 percent for the largest governments and 24.2 percent for the smallest.

Of the 234 returned questionnaires, 226 tribal governments (97 percent) maintained some form of tribal enrollment record. Approximately three-quarters of these records were stored within computer-based record-keeping systems. The survey found that 85 percent of the tribal governments included both member residents and member nonresidents on their tribal rolls; less than 5 percent limited their recording to resident members.

The majority of tribal governments reported that they had updated their tribal enrollment records. Seventy-five percent stated that updates were made when changes were reported. A small number reported that their records were updated on a monthly or annual basis, while others updated their records at some other frequency.

The Census Bureau determined that the addresses contained in the computerized tribal enrollment records of the American Indian and Alaska Native governments could increase census coverage for Census 2000. However, the lack of computerized records for 40 percent of the American

Indian and Alaska Native populations living on reservations or trust lands could prove to be a serious drawback. Although respondents reported that some effort was made to update tribal records, the findings lacked an evaluation of the completeness, accuracy, or timeliness of the data. If the records were determined to be useful for increasing Census 2000 coverage, the Census Bureau would need to obtain the cooperation of the tribal governments. In the past, such arrangements with tribal governments have proven both costly and time-consuming.

Because the use of tribal records was viewed as a valuable tool for more accurately counting American Indian and Alaska Native populations, the Census Bureau proposed several actions to determine the usefulness of these records for Census 2000. These proposals (many of which were tested in the 1996 Community Census) included:

- Selecting one or more of the larger tribes that did not have computerized records to discuss the feasibility of computerization.
- Visiting a sample of tribes to help learn what they meant by “updating” and develop some understanding of the difficulties involved in collecting tribal-roll data.
- Investigating the desirability and feasibility of a program through which the Census Bureau would set a deadline for each participating tribal group to commit to updating its tribal rolls. This investigation would include determining the resources and funding necessary for updating and assessing the extent to which the Census Bureau would participate in the project.
- Exploring the quality of the information on the tribal rolls.
- Exploring the desirability and feasibility of providing the properly sorted tribal records to the census processing sites for use in matching once the questionnaires were received from local offices.
- Enlisting the tribal officials and others who were responsible for completion of the survey questionnaire as a “body of experts.” This group could be asked to react to proposals, provide insights on proposed activities, and in the process, develop a working relationship with Census Bureau staff.
- Considering conducting a test census involving a limited number of tribes that would utilize tribal records to improve coverage.

1994 National Census Test I⁷⁵

The 1994 National Census Test I, or Coverage Test, was conducted in January 1994 to identify a household rostering method that would maximize within-household coverage and minimize enumeration error. It focused on inadvertent respondent roster errors that stem from the respondents’ misunderstanding the residence rules and thus erroneously including or excluding some household members.

The Coverage Test was a mailout/mailback national sample survey of 44,000 housing units. Like the Simplified Questionnaire Test, Implementation Test, Mail and Telephone Mode Test, and Appeals and Long-Form Experiment, the Coverage Test sample was divided evenly between two strata consisting of low-response areas and high-response areas in the 1990 census. Within each stratum, the sample was allocated equally to two panels, reflecting the two experimental treatments. All housing units received an advance notice letter, initial questionnaire, and reminder postcard; nonrespondents to the initial form also received a replacement questionnaire.

A subset of 18,200 responding housing units received a telephone follow-up reinterview, which identified respondent roster errors and facilitated the comparison between panels of gross coverage error (that is, the sum of people erroneously included in and those erroneously excluded from the household).

⁷⁵ U.S. Census Bureau, “1994 National Census Test Overview,” October 1993.

Two experimental forms were developed for the Coverage Test, one for each panel. The first form used the 1990 census rostering approach with minor content and format modifications. The second form tested an extended roster method by expanding the boundaries of who should be included. To identify people counted at the residence because of the less restrictive rostering approach, four screener questions were added to determine who should not be counted, rather than allowing the respondent to make this determination.

The Coverage Test found that:

- Both forms had small gross error rates, indicating that both were effective in producing an accurate roster.
- There was no significant difference between the two panels in gross error rates, average household size, and the average number of residents obtained from the initial roster question.
- Both the coverage questions on the modified 1990 form and the roster probes on the extended roster form produced high rates of misclassification of residence status and would need revision if they were to be tested further.

1994 National Census Test II⁷⁶

The 1994 National Census Test II⁷⁷ was conducted in March to study telephone enumeration of nonrespondent households. Telephone interviews were conducted with a sample of nonrespondents to the 1994 National Census Test I (Coverage Test) mail questionnaire. Nonrespondents' addresses from the Coverage Test were submitted to a vendor to obtain telephone numbers, and the inhabitants of a sample of these housing units were given a telephone interview.

During the 1990 census, data collection from nonrespondents was conducted primarily by personal visit—a costly and labor intensive operation that presented challenges in hiring, training, and control. The 1994 National Census Test II sought to determine if telephone enumeration was effective, thus allowing more flexibility in the nonresponse follow-up implementation strategy.

The results of the 1994 National Census Test II were as follows:

- An estimated 48 percent of nonresponse cases for which a telephone number was obtained completed a questionnaire by telephone interview.
- The sample for the test was allocated among two strata—high and low coverage areas. There was not a significant difference in the percentage of completed interviews between strata; however, there was a significant difference in the percentage of refusals, disconnected telephone numbers, and language problems. The high coverage strata had a higher refusal rate, but the low coverage strata had a higher percentage of disconnected telephone numbers and language problems.
- A telephone number was obtained for 18.4 percent of the nonresponse addresses from the 1994 National Census Test I (Coverage Test). For the high coverage and low coverage strata, a telephone number was obtained for 26.6 percent and 17.6 percent of nonresponse addresses, respectively.
- The refusal rate (calculated using refusals plus completed interviews as the base) was estimated at 31.2 percent in the high coverage strata and 24.6 percent in the low coverage strata.

⁷⁶ Kent Wurdeman, U.S. Census Bureau, "National Census Test II Final Evaluation Report," June 1994.

⁷⁷ The test originally was considered phase two of the Telephone Matching Study. Phase one addressed the issues of availability and accuracy of the telephone numbers in vendors' files. For phase one, 135,000 addresses were sent to a commercial vendor (MetroNet) to obtain telephone numbers for the addresses that matched to their file. The addresses represented a sample of housing units on the 1990 census address file that were included in previous national census tests (the Simplified Questionnaire Test, the Implementation Test, the Appeals and Long-Form Experiment, and the Mail and Telephone Mode Test). A subsample of addresses with telephone numbers was selected and a brief telephone interview was conducted to verify the accuracy of the telephone number provided for the address. For more information, see Kent Wurdeman, U.S. Census Bureau, "Telephone Matching Study: Final Evaluation Report," DSSD 2000 Census Memorandum Series, #E-83, May 2, 1994.

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- The item nonresponse rate was negligible for all items except the “tenure question” in the low coverage strata. About 4 percent of the respondents in the low coverage strata were unable to answer this question.

1994 Address System Information Survey

The 1994 Address System Information Survey was conducted in September 1994, to determine the prevalence of non-city-style addresses throughout the nation and the likelihood that these addresses might be converted to city-style addresses prior to Census 2000.⁷⁸ Current information on the extent of non-city-style addresses and the timing of their expected conversion was needed to determine how to handle these addresses in the Census 2000 master address file. Non-city-style addresses presented problems in past censuses as many of them were difficult to locate and required more time for follow-up operations. (Since the 1990 census, many areas converted to city-style addresses to support local Enhanced 911 emergency programs and to facilitate mail delivery.)

The Address System Information Survey was a telephone survey of government personnel in counties—and minor civil divisions (MCDs) in the New England states, Pennsylvania, and Michigan—in which fewer than 95 percent of residential addresses were city-style addresses. The universe encompassed approximately 4,300 counties and MCDs. For purposes of analysis, the MCDs were combined into their county entities.

The telephone survey form was a single page that asked for information about the extent of city-style addresses in the government’s jurisdiction. If the government official indicated that some or all of the jurisdiction contained non-city-style addresses, he/she was asked if there were any conversion plans to city-style addresses and the time frame for establishing such a system.

The Address System Information Survey revealed that:

- In September 1993, 41 percent of all counties in the survey universe had city-style addresses for at least 95 percent of their residential addresses.
- Countywide city-style addresses were expected to be in place in 73 percent of all counties in 1997 and 78 percent of all counties in 1999.

1995 CENSUS TEST

While the tests that the Census Bureau conducted between 1992 and 1994 were used to understand the effects of individual changes to the census questionnaires, the agency still needed to determine how each of the changes would work in aggregate. The 1995 Census Test allowed the Census Bureau to integrate its plans to introduce: (1) new uses of sampling and estimation; (2) new procedures to reduce the undercount; (3) new avenues for greater cooperation; (4) new uses of technology; and (5) new methods for collecting long-form data (see Table 2-4).

These five categories of change were based on the Census Bureau’s basic strategies for conducting Census 2000. These strategies (building partnerships, simplifying forms and response procedures, using technology intelligently, and increasing the use of statistical methods) were at the center of its efforts to redesign the census.

Four sites (three urban and one rural) were initially proposed for the 1995 Census Test. Of these four, three were chosen:⁷⁹ Oakland, CA; Patterson, NJ; and a grouping of six parishes—De Soto, Red River, Bienville, Jackson, Natchitoches, and Winn—in northwest Louisiana.

These sites were chosen based on the goals of the test, budgetary considerations, and site-specific criteria including the mixture of minority groups in the area and the type of mail delivery (city-style delivery versus non-city-style). These and other characteristics were associated with the differential undercount. All sites shared the common thread of having poor mail response rates in

⁷⁸ Non-city-style addresses are those with no house number or street name, such as rural route/box number, post office box number, and general delivery addresses.

⁷⁹ New Haven, CT, was proposed as a third urban site, but dropped due to budgetary constraints before the test began.

the 1990 Census. Table 2-6 summarizes several of the significant characteristics of the sites selected for the 1995 Census Test.

Table 2-6.
Values of Selected Variables Used to Choose Urban and Rural Sites for the 1995 Census Test

Criteria	Urban sites	Rural sites
Total housing units	50,000 (Oakland, CA) 175,000 (Patterson, NJ)	50,000
Racial/Ethnic population:		
Black	15% or more	6% or more
Hispanic	12% or more	3% or more
Asian/Pacific Islander	4% or more	1% or more
American Indian/Alaska Native*	—	—
Multi-unit structures (with a predominance of structures with 2–9 housing units)	37% or more	7% or more
Poverty status	13.1% or more	13.1% or more
Response rate	63% or less	63% or less
Rental units	38% or more	16% or more

* No criteria are shown for the American Indian/Alaska Native populations because the Census Bureau planned to refine the design of the Census 2000 plan for these populations after the 1995 Census Test.

New Sampling and Estimation Procedures

The 1995 Census Test studied the use of sampling and estimation procedures to reduce the differential undercount and the cost of the census. The test compared housing unit and block samples using statistical techniques and administrative records to reduce the differential undercount. It also estimated the number and types of persons missed by the enumeration at the time census operations were underway, enabling the Census Bureau to identify methods for increasing coverage and reducing costs.

The Census Bureau also evaluated two alternative sampling methods for enumerating the nonresponse universe, “truncation” and “direct” sampling. Truncation was a procedure by which the Census Bureau chose a minimum response threshold that it would reach through a combination of mail returns and (if necessary) follow-up operations. Once the threshold level was met, a sample would be taken from the universe of the remaining nonrespondents and would be used to establish an estimate of the number of nonresponding households. For the 1995 Test, the Census Bureau established a threshold of 90 percent, and sampled the remaining nonrespondents at a rate of 1-in-10.

For direct sampling, on the other hand, the Census Bureau allowed respondents a specific amount of time to respond. After the cut-off date for the mailout/mailback phase, a sample of the nonresponding universe was selected for enumerator follow-up. The Census Bureau selected enough units in each county to reach a 90 percent response rate.

Analysis of the test results supported the use of a housing-unit sample (rather than a block sample) design for nonresponse follow-up (with oversampling of long forms to ensure content quality) for the following reasons:

- There was no evident difference in coverage or the quality of estimates between the two methods.
- At lower levels of geography, the use of the block as the sampling unit resulted in a sampling error rate that was three times greater than that for the housing unit design.
- There was no projected cost difference between the truncated and direct sampling designs.
- For the direct sampling design, the cost of using a housing unit sample was about 6 percent more than a comparable block unit sample.
- The housing unit design resulted in a lower sampling error rate at lower levels of aggregation.

The 1995 Census Test results suggested that direct sampling would be preferable to the truncation method for enumerating the nonresponse universe (with oversampling of long forms to protect content data quality) because:

- Field data collection costs were significantly higher for truncation with a 90 percent threshold than for other methods. Costs for a 70 percent truncation, direct sampling with no long-form oversampling, and direct sampling with long-form oversampling were all relatively comparable.
- Direct sampling and truncation methods yielded comparably reliable measures, both at the tract and site levels.
- Field data collection management can be more easily controlled and implemented using direct sampling. Truncation is more difficult to manage since it splits nonresponse follow-up into two separate operations.

Sampling and estimation to correct for net-coverage error. The Census Bureau has used coverage measurement surveys to evaluate the accuracy of population figures since the 1950 census. However, integrating data from the coverage evaluation program into the calculation of census population counts was first accomplished during the 1995 Census Test. Agency officials were concerned about integrating coverage measurement into Census 2000, because it was not clear it could be completed by the December 31 deadline for delivering apportionment counts to the President. This test included the implementation and evaluation of the Census Bureau's Integrated Coverage Measurement (ICM) process.⁸⁰

The 1995 Census Test compared two basic estimation methods for integrated coverage measurement, CensusPlus and dual system estimation (DSE).⁸¹ Obtaining a valid estimate requires that the raw data flowing into the final estimation are correct. Once the data have been collected, one of the most important requirements for estimation was measuring and correcting the differential undercount. The 1995 Census Test evaluated the assumptions of both estimation methods to be sure that each used reliable data to generate its final figures and evaluated how well each corrected for the differential undercount.

CensusPlus and DSE both used data collected on census questionnaires and in the ICM survey to generate their estimates. The ICM required creating an independent list of the housing units in the sample blocks to be developed before the census. By comparing this independent list with the master address file and reconciling the differences, the Census Bureau was able to create an enhanced housing list that could be used during the ICM interviewing, which began at the end of nonresponse follow-up. The interviews used computer-assisted personal interviewing (CAPI)⁸² to develop household rosters for the ICM that were independent of the rosters gathered during the census. Once an independent roster had been generated, the CAPI system compared it to the one from the census, and the interviewer was instructed to reconcile any discrepancies between the two. The resolved rosters were reviewed and subjected to "unduplication" at the National Processing Center in Jeffersonville, IN.

On August 17, 1995, the data generated to this point were used as the basis for the CensusPlus estimator. For DSE, on the other hand, the Census Bureau had to complete further office processing and field work. For the DSE, the Census Bureau used the independent rosters from the ICM as

⁸⁰ Integrated Coverage Measurement combines estimates of missed persons with enumeration results before producing a single set of official census results. The program (and the use of this technique) was cancelled following the 1999 Supreme Court ruling that the Census Act prohibits the use of sampling to apportion seats in the U.S. House of Representatives.

⁸¹ Comparison of CensusPlus and DSE focuses on the fact that they have different underlying assumptions. CensusPlus estimation is based on the assumption that the ICM finds the "truth" in the sample blocks, the truth being the resolved rosters from the field reconciliation. The DSE assumes the independent roster collected during the independent part of the ICM interview is another independent list, but not necessarily the "truth." The DSE estimates people on neither list while CensusPlus finds them through the reconciliation process during the interview. The two estimates of the additional people are the basis of comparison between the two methodologies. For more information, see Mary H. Mulry and Rajendra P. Singh, "New Applications of Sampling and Estimation in the 1995 Census Test," *Proceedings of the Survey Research Methods Section, Exploring Fundamental Change: The 1995 Census Test*, Vol. XXIII, American Statistical Association, 1994, pp. 742–47.

⁸² Computer-assisted personal interviewing (CAPI) involved an enumerator completing a personal enumeration of a household using an electronic survey (and laptop computer) that collected the same information as that requested by the paper questionnaire.

the population sample (P sample) and the rosters from the census questionnaires as the enumeration sample (E sample). After computer and clerical matching of these two rosters, Census Bureau employees followed up unresolved cases in the field. These additional operations provided the rosters to be used for the DSE. Data for the DSE were ready by October 5, 1995.

The ICM evaluation revealed that DSE performed better than CensusPlus, because it resulted in increased estimated counts for some traditionally undercounted groups, primarily Blacks and renters, while CensusPlus did not. Both DSE and CensusPlus produced increased estimates of Hispanics, but only the former resulted in increased estimated counts for Asians and Pacific Islanders. The poor performance of CensusPlus appeared to be related to the accuracy of the regular census rosters and to problems with the design of the computerized questionnaire the ICM enumerators used. Dual system estimation also was superior for the following reasons:

- The CensusPlus adjustment factor for the post nonresponse follow-up estimate was less than 1.0 for all but 3 of the 14 post-strata for Blacks in Oakland, CA, and for all but one of the Black post-strata in Patterson, NJ, while the DSE adjustment factor for all these post-strata was greater than 1.0.
- CensusPlus added only 6.1 percent of the number of people added by DSE after nonresponse in Oakland, CA, and only 25 percent of those added by DSE for Patterson, NJ.
- The relative pattern in the differential rates of additions for the 1995 DSE across race/ethnic subgroups coincided with the 1990 differential undercount rates, while the pattern produced by CensusPlus was discordant with the 1990 differential undercount rates.
- The relative pattern of additions of persons to block clusters by DSE matched the Census Bureau's indicators (taken from the 1990 post-enumeration survey) for the difficult to enumerate, while CensusPlus did not.

While DSE generally was superior to CensusPlus, the key to achieving the best DSE results was a low noninterview rate. The lower the noninterview rate, the higher the accuracy of the estimate. A large noninterview rate (14 percent) caused a downward bias in the 1995 Census Test results. The Census Bureau found that methods that compensated for noninterviews did not work as well for a high noninterview rate as they did for a low noninterview rate, ideally less than 2 percent.

New Procedures to Reduce the Undercount

The 1995 Census Test provided an opportunity to try key operational components of the Census 2000 plan, several of which were designed to reduce the differential undercount:

- Simplified questionnaire and multiple mail contacts
- Improved rosters and coverage questions
- Initial mailout of Spanish-language questionnaires
- Increased availability of census questionnaires
- Targeted enumeration methods
- Counting the homeless population through service-based enumeration and special place enumeration
- Administrative records

Simplified questionnaires and multiple mail contacts. The 1995 Census Test provided the first opportunity to test a new mailing procedure in the census environment—mailing questionnaires to housing units in 4 stages. In preparation for the test's March 4, 1995 Census Day, prenotices were sent on February 27 to inform the households that the census questionnaire was coming. Two days later, on March 1, the questionnaires were mailed. On March 6, reminder notices that also served as a thank-you note were sent. Finally, a second questionnaire was mailed between March 20 and March 27 to all households for which a completed questionnaire had not been received.

March 29 was selected as the cutoff day for initial response for Oakland, CA. (March 27 was used in Patterson, NJ.) The Census Bureau chose the cutoff date by determining when response from the replacement questionnaire began. Mail response rates increased in both Oakland and Patterson as a result of mailing the replacement questionnaire. In Oakland, the rate increased by approximately 10.4 percent and in Patterson the increase amounted to 9.9 percent. (Response rate increase was calculated by subtracting the initial mail response rate from the final mail response rate.) Though the Census Bureau feared that incorrectly delivered questionnaires from multiunit structures might lead to significant duplication, the duplication rates were 1.7 percent for Patterson and 0.7 percent for Oakland.

In addition to multiple mail contacts, the Census Bureau used an easy-to-complete questionnaire. Previous tests had shown that the mail response increased substantially when questionnaires were easier to understand and complete. An increase also occurred when notifications were sent to alert and remind respondents to complete and return the questionnaire.

Improved rosters and coverage questions. The Census Bureau used revised questions to ensure a complete listing (or “roster”) of household members. The questionnaire used in the 1995 test included a roster question and coverage questions designed to include the correct members of the household and to let the respondent “correct” any mistakes he/she may have made. A new “usual home elsewhere” question allowed respondents to identify individuals and entire households who usually resided at another address.

Coverage edits, which included a clerical review and a telephone follow-up (if necessary), revealed that at least 1 of every 10 questionnaires failed the review. An evaluation revealed numerous problems associated with the coverage questions. The main problem appeared to be that respondents misunderstood either the “usual home elsewhere” question, or the instructions, or both.

Initial mailout of Spanish-language questionnaires. The Census Bureau mailed Spanish-language questionnaires (in addition to English-language questionnaires) to blocks with a high concentration of Spanish-speaking households. This test indicated that there were no significant operational difficulties associated with mailing a Spanish-language questionnaire to households in targeted areas. In addition, the quality of data on the Spanish-language questionnaires was comparable to the quality of those completed in English. In the areas in both Patterson, NJ, and Oakland, CA, that received Spanish-language questionnaires, approximately 60 percent of respondents returned the Spanish version. This trend held true across varying levels of linguistic isolation.⁸³ The results suggested that linguistic isolation alone was not a reliable predictor of where Spanish-language questionnaires would be used most extensively.

Increased availability of census questionnaires. The “Be Counted” Campaign made unaddressed and ungeocoded questionnaires available to people who (1) did not receive an addressed census questionnaire; (2) believed they were not counted; and/or (3) had traditionally been undercounted. Be Counted questionnaire displays were set up at a variety of convenient, easily accessible locations that were divided into three basic categories:

- Generic locations, such as U.S. Post Offices, departments of motor vehicles, libraries, and city halls. The toll-free Telephone Questionnaire Assistance number was included as a Be Counted site because it was so widely publicized.
- Businesses, facilities, and easily accessible spaces frequented by population groups less likely to have received an addressed questionnaire. These “targeted locations” included grocery/convenience stores, laundromats, restaurants/carry-outs, clinics, arcades, and churches.
- Other locations, such as Questionnaire Assistance Centers and service-based enumeration locations such as food pantries, clothing distribution sites, and health care facilities for persons without a usual residence.

⁸³ A linguistically isolated household is a household in which all members 14 years old and over speak a non-English language and also speak English less than “very well” (have difficulty with English). All the members of a linguistically isolated household are tabulated as linguistically isolated, including members under 14 years old who may speak only English.

The Be Counted package consisted of an outer envelope imprinted with a site specific message, the Be Counted questionnaire, and a return mailing envelope addressed to the Census Bureau's National Processing Center (NPC) in Jeffersonville, Indiana.

A total of 4,596 people were enumerated on Be Counted forms for all three test sites. A majority of the Be Counted forms that were returned from targeted and other distribution sites represented, on average, larger households than those received from generic sites. These households also were larger than the average that was reflected in the 1990 census at these sites. The people included in this total resided in 1,696 housing units; 57.1 percent were renters and nearly half lived in multiunit structures. As a result of the Be Counted campaign, 176 housing units were added to the master address file for the three test sites. The toll-free number was particularly effective in collecting Be Counted information at the urban sites as more than 42 percent of the people enumerated on Be Counted forms initiated the interview by telephone. The 1995 Coverage Study demonstrated that 96.4 percent of households in a sample of Be Counted questionnaires had been correctly enumerated.

Targeted enumeration methods. Special methods were tested to target geographic areas and populations that were historically undercounted. The 1995 Census Test studied the following enumeration techniques where there were barriers to enumeration, such as unusual housing situations, mobile populations, or linguistically isolated groups:

- “Blitz” enumeration, which used a group of enumerators to canvass a particular area or location simultaneously to reduce the amount of time needed to complete the enumeration, was found to be very effective.
- Paired enumeration used two enumerators to visit households in areas where there were safety concerns. The evaluation concluded that although paired enumeration alleviated concerns about safety, it was also associated with a reduction of productivity (when compared to two enumerators working separately) and the refusal of some enumerators to work alone.
- Use of local facilitators (local residents or other knowledgeable people who helped census takers canvass and enumerate households) was effective when problems arose.
- No advantage over mail enumeration was found when urban update enumerate was used at the Oakland, CA, site. This operation was used in areas of Oakland where the Census Bureau thought the U.S. Postal Service might have problems delivering the questionnaires and where low mail response rates were expected. The enumerator updated the address list and enumerated the households in the same visit.
- Placement of Questionnaire Assistance Centers in multiunit structures and community-based organizations.
- Gender diverse promotional materials directed at specific population groups were not as effective as those targeting specific neighborhoods.

Service-based and special place enumeration. The 1995 Census Test tried a new approach to enumerating people with no usual residence—counting them at the places where they used services, such as at shelters and soup kitchens. Relying on many sources (e.g., local governments, the Federal Emergency Management Agency [FEMA], state homeless coordinators, and state representatives from private coalitions), the Census Bureau developed a list of service providers for each test site.

The initial service-based enumeration began at shelters on the evening of March 6, 1995, and used regular group quarters enumeration procedures. “Usual home elsewhere” information was collected for evaluation purposes. Enumerators conducted a complete enumeration of soup kitchens on March 7, 1995. Respondents at these locations were counted in the block where the services were located, unless an address for a usual home elsewhere was provided. While the Census Bureau planned for two follow-up enumeration visits, budget constraints allowed for only one,

conducted on March 8 for shelters and March 9 for soup kitchens. The data collected during the follow-up visits were not included in the count for the 1995 Census Test.⁸⁴

Service-based enumeration methods proved to be promising. In Oakland, CA, 937 people were tabulated, 72.7 percent of whom were enumerated in soup kitchens. In Patterson, NJ, 263 people were tabulated (73.3 percent in shelters). In northwest Louisiana, 2 people were counted at shelters and 9 at soup kitchens.

In addition to testing new methods for counting the homeless population, the 1995 Census Test provided an opportunity to assess alternative methods for conducting extensive field operations associated with special places. The Facility/Transient Locations Questionnaire Operations were successfully implemented and evaluated during this test. These two telephone operations replaced the 1990 census special place prelist program, an expensive, labor-intensive field operation that resulted in major quality problems. During the initial facility questionnaire operation, staff at Census Bureau headquarters telephoned approximately 832 special places to collect administrative information, update existing data, identify group quarters and housing units, and assign group quarters type codes. Even though the questionnaires were difficult to understand, this operation was a success.

Administrative records. The 1995 Census Test allowed the Census Bureau to study whether an administrative records database would improve census results. The Census Bureau believed that this database could potentially be used to improve the census address list, obtain information on nonrespondents, and improve coverage measurement methodologies. One possible benefit was that such a database might include information about people who were not counted in the census. Obtaining files that included population groups that the census tended to undercount might provide some of the supplemental data necessary to reduce the differential undercount. This test also studied the kinds of pitfalls involved in using these records.

The 1995 Census Test Administrative Records Database contained both geographic and demographic data for the three test sites. The database incorporated information from sources such as the federal government, state and local governments, and commercial vendors. A match of the database to various 1995 Census Test files allowed for an initial evaluation of this approach.

Of the three sites, administrative records from Oakland, CA, produced the most successful match to census address (64.3 percent). The match rates in Patterson and Louisiana were 29.2 percent and 24.3 percent, respectively. Addresses of people found on two or more administrative files had better match rates to census files than those found on only one file. Multiple source administrative addresses matched at a rate of 61.3 percent to the decennial master address file, compared with 22.7 percent of the single source addresses.

The 1995 Census Test Administrative Records Database provided mixed quality results. Even though it showed promise in improving census results, its weaknesses confirmed that much work was required before administrative records could be used to improve coverage or fill in missing characteristics of individuals in a census environment. While the 1995 Census Test Administrative Records Database successfully provided information that would reduce the undercount for Blacks, it did little to reduce the undercount for Hispanics. Difficulties also were encountered when using the database to determine race, sex, age, and Hispanic origin.

New Avenues for Greater Cooperation

The 1995 Census Test provided an opportunity for the Census Bureau to evaluate basic facets of its partnership program. The Census Bureau planned to develop cooperative ventures and form partnerships to take the census with other federal agencies, state, local, American Indian tribal, and Alaska Native village governments, and with private and nonprofit organizations. The agency also assessed the initial efforts to construct and maintain a master address file and update the automated geographic file in cooperation with the U.S. Postal Service and state, local, American Indian tribal, and Alaska Native village governments.

⁸⁴ For a complete account of why these data were not included in the count for the 1995 Census Test, see David L. Ferraro, "Estimation in the 1995 Census Test Service Based Enumeration," *Proceedings of the Survey Research Methods Section*, American Statistical Association, 1996.

Developing Cooperative Ventures

The Census Bureau planned to use partnerships with governmental and nongovernmental organizations to educate the public about the census. “Partner” organizations collaborated with the Census Bureau to plan enumeration activities, develop and review the address list, recruit people to work on the census, and design and implement outreach and promotional activities.

The goal of the partnerships program in the 1995 Census Test was to develop the best approach and procedures for including local governments in the Local Update of Census Addresses (LUCA) program,⁸⁵ administrative record acquisition, and outreach and promotion.

The partnership program yielded four significant positive results. First, it led to improvements in the data in the master address file. Second, it provided an opportunity for the Census Bureau to procure, use, and process a variety of federal, state, and local administrative records. These files demonstrated a need for improved standards for machine-readable file structures and for address sources. Third, the agency built cooperative relationships with the local citizens who distributed promotional posters and flyers and used their familiarity with the local area to promote census awareness and participation. Finally, partnership participants secured cooperation and assistance from local officials that otherwise might not have been attained.

While the successes of the partnership program were encouraging, several aspects needed further improvement. In general, the Census Bureau needed to:

- Find better ways to reach, communicate with, and support local governments.
- Pay greater attention to educating local governments and organizations about the Census Bureau and its purpose.
- Provide better instruction, training, and reference materials.
- Develop better standards on file structure and address sources when collecting administrative records.
- Provide local officials with compatible file formats and better maps to enable them to more effectively participate in the LUCA program.
- Ensure that critical work was completed on time and supported the regional offices in their efforts (such as collecting administrative records) which required processing a large number of diverse files.

Development of a master address file (MAF). The Census Bureau created a permanent national address list that was updated continually and was used by several Census Bureau programs, including the decennial census. The 1995 Census Test provided an opportunity for further research on compiling and maintaining the master address file (MAF) and updating the TIGER® System in cooperation with the U.S. Postal Service (USPS) and state, local, and tribal governments. The MAF was developed using the USPS’s delivery sequence file (DSF) and the 1990 census address list. The 1995 Census Test included three operations to improve the completeness of the MAF:

1. Precanvass, in which enumerators went into the field and verified or updated the addresses listed in the precensus MAF and verified/corrected block assignments (i.e., geocoding).
2. Local Update of Census Addresses (LUCA) invited local officials to review and update the precensus MAF for their areas.
3. Census Address Check, in which USPS letter carriers reviewed and corrected the precensus address list.

⁸⁵ The addresses provided by the Census Bureau are confidential according to Title 13 of the U.S. Code. The Census Bureau offered an Address List Review Opportunity as part of the Local Update of Census Addresses (LUCA) program in response to Public Law 103-430, the Census Address Improvement Act of 1994. For more information, see Chapter 11, “Legal Issues.”

Both the prec canvass operation and LUCA improved the completeness of the MAF at urban sites. The updating operations revealed that a majority of the housing units on the precensus MAF were unchanged by the prec canvass. The operations deleted more addresses than they added, indicating that the precensus address file included too many addresses. This finding was expected since all the test areas had experienced limited growth.

U.S. Postal Service identification of vacant housing units. The 1995 Census Test provided an opportunity to evaluate how well USPS vacant and nonvacant returns identified vacant housing units. The evaluation compared the USPS classification of these addresses to the results from non-response follow-up and the Integrated Coverage Measurement program in the urban test sites. The evaluation revealed that the USPS did not identify a large number of vacant units at both sites and that many addresses identified as vacant were occupied. A small percentage (between 2.0 and 5.2 percent) of questionnaires that came back as vacant postmaster returns were from addresses that were classified as vacant on the USPS delivery sequence file. The low percentage was the result of a USPS rule that an address must be vacant for 90 days or more to be classified as vacant. The analysis of nonvacant postmaster returns in Oakland resulted in 38 percent being classified as occupied and 30 percent as vacant during nonresponse follow-up. The remaining 32 percent were classified either as deletes or had no status assigned by nonresponse follow-up enumerators. The results of this test showed the necessity of conducting a vacant postmaster return follow-up.

New Uses of Technology

Advanced technologies to contact persons or to allow them to contact census offices.

The 1995 Census Test became the vehicle for testing various computer-assisted survey information collection technologies for use in the census. Integrated Coverage Measurement interviewers used computer-assisted personal interviewing (CAPI) to conduct their interviews. In addition to responding by mail to the census, respondents could call and give their census information to a computer-assisted telephone interviewing (CATI) operator. The CATI instrument was designed in English and Spanish; bilingual interviewers handled calls from English, Spanish and Asian language speakers and a telephone device for the deaf was offered.

As a result of the test, the Census Bureau decided that it needed to find additional sources for telephone numbers and that CATI should be considered the primary method for contacting nonrespondents during nonresponse follow-up; personal visits would be reserved for households that could not be reached by telephone. To improve productivity, nonresponse follow-up calls should be concentrated on weekend days. In addition, there should be one uniform version of Telephone Questionnaire Assistance for both rural and urban areas. The Census Bureau also needed to find ways to encourage respondents, particularly those requesting forms, to use an interactive voice recognition (IVR) system, rather than speaking to an operator. However, because no IVR was available for testing during the 1995 Census Test, the agency recommended further study.

Innovative data-capture methodologies and processing systems. In past censuses, the agency relied on a data capture system that required photographing census questionnaires, processing film, and keying written responses by hand. The new system (evaluated during the 1995 Census Test) produced digital images of every questionnaire and used optical mark and character recognition software to capture the information on completed questionnaires. Keying from image also was used when the recognition technology was unable to interpret entries on the questionnaires.

One focus of the 1995 test was to determine the quality of these alternative data capture modes and to identify parts of the process that needed improvement. The optical character recognition system interpreted all write-in entries and provided a confidence index for each. The results showed that 42 percent of the write-in responses had acceptable confidence levels. However, 5.2 percent were read incorrectly by the optical character recognition system. The optical mark recognition system read 95 percent of the data with an acceptable confidence level, while 1.5 percent were read incorrectly. Five percent of the data were read at an unacceptable confidence level. The

overall error rate for the optical mark recognition system was 4.2 percent. Nearly half (45.3 percent) of the errors that were read as acceptable by the optical mark recognition system were cases in which a respondent scratched out one response and marked another box.

The test also evaluated the success of the keying operation. Of the questionnaires that the data capture system could not interpret, some were keyed from the paper questionnaire and some from the scanned image. The results indicated that the paper keying provided generally better quality results than keying from the image (1.3 percent field error rate for paper keying versus 1.9 percent for image keying). However, the quality of the scanned images was excellent and the difference in error rate may have been due to operational, staffing, and procedural factors.

Fully automated matching. The Census Bureau planned to automate the matching operation for Census 2000. The 1995 Census Test provided an opportunity to test how well the geographic coding software identified duplicate responses from the same address. While only two variables were used for matching (age and sex), the results of the 1995 Census Test suggested that more variables should be used to make the matching operation more discriminating.

For Census 2000, the Census Bureau planned to assign geographic codes, or geocodes, to addresses; this process involved linking addresses to geographic units. For geocodes to be assigned accurately, the Census Bureau needed to create a unique reference to each address geographically or spatially using the Topologically Integrated Geographic Encoding and Referencing (TIGER®) system. One component of automated geocoding was automated matching.

The automated matching and geocoding worked very well—94 percent of the computer-assigned geocodes agreed with an enhanced address list produced independently for evaluation purposes. After reviewing the 6 percent of cases that did not match and removing cases that resulted from systemic errors, such as deficiencies in the TIGER® database, the geocoding software successfully matched at least 99.7 percent of the addresses. The most significant problems with automated matching software were how to handle missing data, how to define matching parameters, and how to determine cutoff weights for classifying addresses as matched or not matched.

New methods for collecting long-form questionnaire data. The Census Bureau experimented with collecting long-form (sample) data using multiple data-collection forms during the 1995 Census Test. This test used three versions of the sample form: an abbreviated version with 16 questions, a 37-question version, and a comprehensive 53-question version. Results from the test showed that total response rates decreased significantly as the length of the form increased. However, the rate decrease leveled off between the medium length and the longest version. The reduction in the overall response rate appeared to depend on the number of questions added, the overall number of questions, the number of pages the questionnaire contained, and the increase in the weight of the form.

The 1995 Census Test also tested the placement of the housing questions and the 100 percent and sample person questions on the form. The results showed that placement of the housing unit questions with Person 1 and combining the 100 percent and sample person questions did not affect the person data differently among the forms. Therefore, the redesigned questionnaire could be used without the loss of person data and without an increase in the number of questionnaires requiring either edit follow-up or imputation.

1995 Census Test Results and Summary

The 1995 Census Test provided information the agency needed to make decisions for Census 2000. Analysis of the test data also suggested promising directions for future research. Among the key findings and conclusions were:

- The new techniques being used to create the census address list were substantially better than past attempts. Census Bureau staff learned to work with local officials to develop address lists, identified some areas that needed further refinement, and highlighted operations that could be dropped without reducing the quality of the master address file.

- Confirmation of the importance of developing partnerships, especially at the local level. The challenge was to build these partnerships without placing an undue burden on the Census Bureau.
- The agency continued to refine the full mail treatment consisting of a prenotice, questionnaire, reminder/thank you card, and a second questionnaire. Because questions remained about the feasibility of mailing the second questionnaire to all nonresponding housing units, the Census Bureau planned to explore the possibility of mailing a second questionnaire to every address regardless of initial response rates in targeted areas.
- Service-based enumeration showed great promise for counting the population without a usual residence.
- The Facility/Transient Locations questionnaire operations successfully replaced the labor-intensive and costly special place prelist operation. These operations were converted to a computer-assisted telephone interview for use in the Census 2000 Dress Rehearsal and were further refined for Census 2000.
- The Be Counted program was successful, although the Census Bureau received fewer forms than anticipated.
- The results of using the U.S. Postal Service to report the status of postmaster returns indicated that the Census Bureau must follow up on at least a sample of the vacant units in Census 2000.
- The 1995 Census Test allowed only a preliminary evaluation of the benefits of using administrative records, but it established potential for using these records to reduce the differential undercount.
- The Census Bureau decided to use a housing-unit sample for nonresponse follow-up with a sampling fraction of 1 in 10 and a truncation level of 90 percent.
- CensusPlus results were below expectations. A refined version was tested in the 1996 Community Census.

1996 CENSUS TESTS

The Office of Management and Budget's Statistical Policy Directive No. 15

In response to legislative, programmatic, and administrative needs, the Office of Management and Budget (OMB) issued in 1977 the "Race and Ethnic Standards for Federal Statistics and Administrative Reporting." These standards were established in OMB's Statistical Policy Directive No. 15. This directive established four racial categories (American Indian or Alaska Native; Asian or Pacific Islander; Black; and White) and two ethnic categories (of Hispanic origin; and Not of Hispanic origin) that were used throughout the federal government for nearly two decades.

Modernizing Race and Ethnicity Categories

By the early 1990s, the OMB's Statistical Policy Directive No. 15 was drawing increasing criticism from individuals and groups who argued that the categories were no longer adequate for capturing and reporting the growing racial and ethnic diversity of the Nation's population. Responding to such concerns, the OMB solicited comments and testified at hearings on Statistical Policy Directive No. 15 during the summer of 1994. OMB also established an Interagency Committee for the Review of Racial and Ethnic Standards, drawing members from over 30 agencies, in order to assess federal needs for racial and ethnic data. This committee drafted several recommendations aimed at improving the government's ability to collect sufficiently detailed data to provide a more accurate picture of the nation's growing racial and ethnic diversity. The committee advocated expanding the number of race categories from four to five, and allowing respondents to mark more than one racial category.⁸⁶

⁸⁶ *Federal Register* notice, July 9, 1997. This notice announcing proposed revisions to Statistical Policy Directive No. 15 was placed by the Office of Management and Budget.

The Census Bureau, through its research for Census 2000, played a significant role in helping to evaluate how best to gather race and ethnicity data while complying with several of the proposed changes to Directive No. 15.⁸⁷ The two tests conducted by the Census Bureau in 1996 helped the agency prepare for Census 2000 and provided OMB and its Interagency Committee with research results that helped them in their review of Statistical Policy Directive No. 15. While the 1996 National Content Survey (NCS) was a vehicle for testing and evaluating the full subject content for Census 2000, including specific question wording, format, and item sequence, one major focus was testing alternative versions of the race and Hispanic origin questions. The two key issues studied by the National Content Survey were: (1) whether adding a “multiracial” category to the race question would affect how people reported race and Hispanic origin and (2) whether placing the Hispanic origin question before the race question affected how respondents reported race and Hispanic origin. The 1996 Race and Ethnic Targeted Test (RAETT; also known as the 1996 Census Survey) also addressed these two issues, but drew its sample from targeted race and ethnic populations, and thus provided findings for small population groups. The RAETT was the principal test of questions on race and ethnicity and focused exclusively on testing and evaluating possible changes to the questions on race and ethnicity for Census 2000.⁸⁸

1996 National Content Survey (NCS)⁸⁹

The 1996 National Content Survey (NCS), also known as “The 2000 Census Test,” was the major vehicle for testing subject content and specific question wording, format, and sequencing of items for Census 2000.

One of the main goals of the NCS was to increase the Census Bureau’s understanding of how respondents would report when asked race and ethnicity questions that conformed with the proposed changes to Directive No. 15. In particular, the test provided respondents with a “multiracial” category in the race question and it tested which sequence of the race and ethnicity questions provided the better response rate. Since the survey tested the entire content for Census 2000, it also was used to measure the effect on response rates of such factors as subject content, specific question wording, format, item sequence, and package design.

Research conducted prior to the NCS had shown that there were several methods to improve mail response rates for mail surveys. Although these techniques were not the focus of the test, the following were included:

- Respondent-friendly questionnaire design.
- Use of advance letters to legitimize the survey request and communicate its importance.
- Emphasis on the government sponsorship of the survey.
- Mailing of a reminder postcard.
- Mailing of a replacement questionnaire to nonrespondents.
- Inclusion of a mandatory message, such as “Your Response is Required by Law,” on the outgoing envelope.

Stratified sampling was used to select a national sample of 94,500 housing units for the NCS. The NCS sample households were allocated among 13 experimental panels, 7 of which received the 100 percent (short) questionnaire and 6 of which received the sample (long) questionnaire. Each of the 13 panels was drawn from two strata based on race, Hispanic origin, and tenure (i.e., owner or renter) variables at the census tract level. One stratum, the low coverage area (LCA),

⁸⁷ The Census Bureau also conducted a test in connection with the Current Population Survey. The findings are available in a 1996 report “Testing Methods of Collecting Racial and Ethnic Information: Results of the Current Population Survey Supplement on Race and Ethnicity.”

⁸⁸ U.S. Census Bureau, “Findings on Questions on Race and Hispanic Origin Tested in the 1996 National Content Survey,” December 1996; “1996 National Content Survey,” DSSD Memorandum No. 2, November 12, 1996; “Results of the 1996 Race and Ethnic Targeted Test,” May 1997.

⁸⁹ Much of this section is based on “1996 National Content Survey,” DSSD Memorandum No. 2, November 13, 1996; and Population Division, “Findings on Questions on Race and Hispanic Origin Tested in the 1996 National Content Survey,” December 1996.

contained a high proportion of minority persons and renters. The other was termed the high coverage area (HCA) and contained the remainder of the addresses. The seven short-form (100 percent) questionnaire panels contained a sample of 2,400 housing units from the HCA and 3,600 housing units from the LCA stratum. The six sample-questionnaire panels contained a sample of 3,500 housing units drawn from the HCA, and 5,250 housing units from the LCA stratum.

On February 23, 1996, the Census Bureau mailed participants an advance letter informing them that they had been chosen for this survey. Questionnaires were mailed February 28, 1996, in time for the U.S. Postal Service to deliver the packages to households on or before “Census Day,” March 3, 1996. Reminder cards were mailed to all questionnaire recipients on March 4, 1996. A replacement questionnaire and reminder letter were mailed to nonrespondents on March 20, 1996. Although a deadline was not indicated on the survey forms, the Census Bureau stopped checking in forms on May 15, 1996.

Two of the NCS questionnaires replicated the short- and long-forms used during the 1990 census. The remaining forms included variations of the experimental forms designed by contractors (Two Twelve Associates, Inc. and Dr. Don Dillman of Washington State University). The long-form questionnaires varied in the number of questions asked, but ranged from 33 to 51 items per questionnaire.

Following check-in, Census Bureau staff conducted approximately 37,800 computer-assisted telephone re-interviews during May and June 1996 to assess the reliability of information collected. Most entries were computer coded using a master file built from the 1990 census. Entries that could not be coded by computer were coded by clerks. The national response rate to the short-form questionnaire for the 1996 NCS was 72.45 percent. Response ranged from 46.40 percent to 80.47 percent depending upon the area and the questionnaire. The national response rate to the long-form questionnaire was 64.75 percent. Response rates ranged from 41.15 percent to 72.57 percent.

The data received from the NCS were used to determine response rates and the accuracy of data following the additions and/or changes to the short- and long-form questionnaires. The following were some of the specific items tested and their results:

- Adding a “Multiracial or biracial” response category for the race question—The survey found that approximately 1 percent of persons reported as multiracial when a “Multiracial or biracial” response was an option to the race question. Further, adding a “Multiracial or biracial” category had no statistically significant effect on the number of individuals reporting as White, Black, American Indian or Alaska Native, and Asian or Pacific Islander. Finally, a “Multiracial or biracial” category followed by the Hispanic origin question reduced the percentage of people reporting in the “Other race” category of the race question.
- Changing the sequencing of the Hispanic origin question (placing it immediately before the race question)—The 1996 National Content Survey tested whether placing the Hispanic origin question before the race question would signify to Hispanics that they should choose one of the race categories and identify themselves as Hispanic in the Hispanic origin question. Past research had shown that a number of Hispanics viewed themselves as racially Hispanic and/or expected to see “Hispanic” as a response option for the race question. Because “Hispanic” was not an option, respondents identifying as racially Hispanic did not respond to the question or marked the “Other race” category. Survey results showed that placing the Hispanic origin question before the race question significantly reduced nonresponse to the Hispanic origin question. Second, changing the sequence of the race and Hispanic origin questions had no impact on response for those identifying as White, Black, American Indian or Alaska Native, and Asian or Pacific Islander. Finally, placing the Hispanic origin question before a race question that did not include the “Multiracial or biracial” category: (1) reduced the percentage of persons reporting in the “Other race” category of the race question and (2) increased the number of Hispanics reporting in the “White” category of the race question.
- Removing the household roster—Three experimental forms simplified or eliminated the household roster, simplified the existing roster’s instructions, or replaced the roster with a numeric household count. The test roster included space for respondents to report up to five people living within the household. Additional occupants (in households with more than five occupants)

were accounted for by the numeric count of total occupants. Two of the experimental forms included space for the names of these additional occupants; however, individual data on more than five people within a household were not recorded. Census enumerators visited households reporting more than five occupants to confirm the accuracy of the questionnaire. The survey indicated that there was a significant difference in response rates at the national level when the roster was eliminated and replaced with a simple numerically entered household count. Eliminating the questionnaire roster appeared to improve response rates for high coverage areas, though there was no significant improvement in response rates for the low coverage area stratum.

- **Adjusting questionnaire length (to determine its effect on response rates)**—The NCS studied the impact of the questionnaire's length on response and tried to determine if response rates could be increased by designing questionnaires to be more visually appealing and user-friendly. Past research suggested the length of the census questionnaire may have an impact upon response rate. The survey data found that questionnaire length did not appear to impact response rate so long as the questionnaire employed a user-friendly design, carried a mandatory response message,⁹⁰ and was supplemented by additional mailings, including a pre-census notification letter, reminder card, and duplicate questionnaire for nonrespondents.
- **Adding a household income question**—The addition of a household income question was studied to determine if asking for data on such a sensitive subject had an impact on response rates. Survey results indicated that there was no significant difference in response on the national level or for the high coverage area stratum. There was a slight reduction in response rates to this question in the low coverage area stratum.
- **Testing two questionnaire package designs: (1) the Official Government Approach and (2) the Public Information Design Approach**—The NCS compared the response rates for two different questionnaire designs, the “Official Government Approach” and the “Public Information Design.” The Official Government Approach questionnaire and envelope, designed by the Census Bureau, incorporated visual and content features that were consistent with the public's expectations of a government-sponsored survey. The green questionnaire and white, inexpensive-looking envelope were designed to have an “official” appearance. The envelope included an additional statement informing the recipient of the government's sponsorship of the survey and the public's legal responsibility to participate. Such statements had been found to improve response rates. The Public Information Design Approach, tested using two of the short-form questionnaires, was designed to be user-friendly and appealing while still promoting a sense of urgency. The questionnaire packages used color (predominantly gold with blue designs), informational icons (in the place of words), and graphics to attract and hold a recipient's attention. Survey results indicated that on the national level, the Official Government Approach, which included the mandatory statement regarding the respondent's obligation, had a higher response rate than the Public Information Approach. This was attributed to its more “official” appearance, compared with the brightly colored envelopes developed for the Public Information Design Approach.

1996 Race and Ethnic Targeted Test (RAETT)⁹¹

The 1996 Race and Ethnic Targeted Test (RAETT), like the National Content Survey, performed a dual function; the test served as part of the research program to evaluate proposed changes to OMB's Statistical Policy Directive No. 15 and it allowed the Census Bureau to test the instructions and wording of the race and ethnicity questions for Census 2000. The agency wanted to be sure that its specific questions for Census 2000 would comply with the proposed changes to OMB's Directive No. 15.

The RAETT had four research goals. First, it was designed to determine the effects of allowing respondents to report more than one race; second, to determine the effects of placing the

⁹⁰ The mandatory response message informed respondents that federal law (Title 13) legally obligated them to complete and return the census questionnaire.

⁹¹ U.S. Census Bureau, Population and Decennial Statistical Studies Divisions, “Results of the Race and Ethnic Targeted Test: Population Division Working Paper No. 18,” May 1997.

Hispanic origin question immediately before the race question; third, to determine the effects of collecting race, Hispanic origin, and ancestry information in a combined, two-part question; and finally, to test alternative terminologies, classifications, and formats in the race question.

The RAETT was a mail-out/mail-back survey of households; questionnaires were mailed to a sample of approximately 112,100 households from selected census tracts, American Indian reservations, and Alaska Native villages (see Table 2-7). Recipients of the survey were chosen from 1990 census data showing census tracts with a high proportion (relative to the nation as a whole) of households in 1 of 6 specified racial or ethnic groups: Black, American Indian, Alaska Native, Asian and Pacific Islander, Hispanic origin, or White.

While the National Content Survey drew a sample that was close to being nationally representative, the RAETT sample was targeted to include a larger concentration from targeted population groups in order to permit a more meaningful assessment of the effects of different questions on race and ethnicity for relatively small population groups. The particularly important groups were American Indians, Alaska Natives, and detailed groups within the Asian and Pacific Islander and the Hispanic populations. Because the RAETT drew a targeted sample, its results could be generalized only to the portions of the specified population groups residing in areas with relatively high concentrations of the targeted groups, which represented only a small proportion of each specified population group.

Table 2-7.
RAETT Survey Sample Size and Response Rate

Target population	Mail response rate (percent)	Sample size
White	71.3	17,500
Black	47.4	26,550
Hispanic	44.1	26,550
American Indian	53.1	15,850
Asian and Pacific Islander	55.2	23,700
Alaska Native	34.0	1,950
Total	52.6	112,100

Census Day for this survey was June 22, 1996. On June 14, 1996, an advance letter was mailed to survey participants detailing the importance of their participation in the survey and their legal obligation to return a completed questionnaire. The initial questionnaire was mailed June 18, 1996. It was followed by a reminder postcard (mailed June 26, 1996) and finally a replacement questionnaire, sent only to households that had not returned the initial questionnaire, with a letter for nonrespondents (mailed July 16, 1996). Hispanic households⁹² were sent two questionnaires, one in English and one translated into Spanish; respondents in these households were asked to complete and return only one. Almost 38 percent of Hispanic households returned the Spanish-language questionnaire.

⁹² The RAETT sample of 112,100 households was drawn from census tracts, American Indian reservations, and Alaska Native villages that the 1990 census showed to have high proportions (relative to the nation as a whole) of households in 1 of 6 specified racial or ethnic groups: Black, American Indian, Alaska Native, Asian and Pacific Islander, Hispanic origin, or White. For each of these specified population groups, the census tracts that satisfied the "high proportion" criterion became a sampling frame from which a sample of households was selected.

The RAETT survey included eight different panels with eight different questionnaires, labeled “A” through “H.” There were seven experimental panels and one control (see Table 2-8).

Table 2-8.
Race and Hispanic Origin Question Design Features by Panel⁹³

Separate race and Hispanic-origin questions				Combined race, Hispanic-origin, and ancestry questions		Separate race and Hispanic-origin questions	
Panel A	Panel B	Panel C	Panel D	Panel E	Panel F	Panel G	Panel H
Modified 1990 Census Race Question	“Multiracial or biracial” category	“Mark one or more races” instruction	“Multiracial or biracial” category	“Multiracial or biracial” category	“Mark one or more boxes” instruction	“Multiracial or biracial” category	“Mark all that apply” instruction
Separate categories: “Indian (Amer) Eskimo Aleut”	Combined category, “Indian (Amer.) or Alaska Native”	Combined category “Indian (Amer.) or Alaska Native”	Combined category, “Indian (Amer.) or Alaska Native”	Combined category, “Indian (Amer.) or Alaska Native”	Combined category, “Indian (Amer.) or Alaska Native”	Combined category and spell out “American Indian or Alaska Native”	Combined category, “Indian (Amer.) or Alaska Native”
“Hawaiian”; “Guamanian” categories	“Hawaiian”; “Guamanian” categories	“Hawaiian”; “Guamanian” categories	“Native Hawaiian”; “Guamanian” or “Chamorro” categories	Combined category “Asian or Pacific Islander”	Combined category “Asian or Pacific Islander”	“Native Hawaiian”; “Guamanian” or “Chamorro” categories	“Hawaiian”; “Guamanian” categories
No alphabetization	No alphabetization	No alphabetization	No alphabetization	No alphabetization	No alphabetization	Alphabetize Asian and Pacific Islander groups	No alphabetization
Modified 1990 census Hispanic-origin question	Modified 1990 census Hispanic-origin question	Modified 1990 census Hispanic-origin question	Modified 1990 census Hispanic-origin question	Combined question	Combined question	Modified 1990 census Hispanic-origin question	Modified 1990 census Hispanic-origin question
1995 Test Census sequence: Hispanic origin followed by race	Hispanic origin followed by race	Hispanic origin followed by race	Race followed by Hispanic origin	Combined question	Combined question	Hispanic origin followed by race	Hispanic origin followed by race

RAETT Results

Approximately 53 percent of the survey’s questionnaires were returned. Responses from the survey were used by the Census Bureau to develop race and ethnicity questions for Census 2000 that conformed with OMB Statistical Policy Directive No. 15.

During previous censuses, respondents had been able to self-identify with only one race because Directive No. 15 did not have a provision for collecting and tabulating multiple responses to the race question. Because Directive No. 15 was in the process of being modified to allow reporting of multiracial data, the Census Bureau tested several approaches to asking respondents to provide an accurate depiction of their racial identification. The RAETT tested three different variations of the race question; some panels were provided a “multiracial” category with write-in lines, a second set was asked to “mark one or more,” and the third set was instructed to “mark all that apply.” The control panel, using the race question from the 1990 census, was instructed to mark only one box. The data gathered by the control panel were used to compare the historical racial series with those data gathered by the new race questions that allowed for multiracial reporting.

⁹³ U.S. Census Bureau, Population Division and Decennial Statistical Studies Division, “Survey Design and Methodology” January 18, 2001.

In general, neither the multiracial category nor the multiple response option had a statistically significant effect on the percent of people who identified themselves solely as White, Black, or American Indian. When a multiracial category was added to the race question, the percent that reported solely as Asian or Pacific Islander decreased; however, much of this was attributed to the drop in those reporting as Hawaiian. In addition, the percentage of those reporting solely as American Indian or Alaska Native was lower for the Alaska Native targeted sample but virtually unchanged for the American Indian targeted sample. When respondents were allowed to identify with more than one race by marking “all that apply” there was a drop in the percentage of people reporting solely as Asian and Pacific Islander. In contrast, there was little effect on the reporting rate for Asians and Pacific Islanders when they were instructed to “mark one or more.” The Census Bureau concluded that the “mark one or more” category would best preserve the historical continuity of data on race and ethnicity.

For the Hispanic-targeted sample, nonresponse to the race question increased among those whose test included the “multiracial” category. Neither of the multiple race response options increased response to the race question among Hispanics and none of the options for reporting more than one race affected the total percentage of responses of Hispanic to the Hispanic-origin question.

When the race and Hispanic-origin questions were combined, a high percentage of responses included both Hispanic origin and 1 of the 4 major race categories allowed under Directive No. 15. The write-in responses to the race question were more detailed from the panels who were instructed to “mark one or more” than those from panels who were told to “mark all that apply.” However, both versions of the instructions provided acceptable responses.

The test also demonstrated that in panels that were asked to mark only one box, some respondents provided unrequested multiple responses; this was true in panels with and without a “multiracial” category. This tendency was most prevalent in the Alaska Native and Asian and Pacific Islander samples.

The second purpose of the RAETT was to determine the effects of placing the Hispanic Origin question immediately before the race question. This was intended to increase response to the Hispanic-origin question.⁹⁴ The change in sequencing reduced, but did not eliminate, nonresponse to the Hispanic-origin question and reporting in the “Other race” category by Hispanics.

The third goal of the RAETT was to determine the effects of collecting race and Hispanic Origin in a combined two-part question. Census Bureau studies have shown that some respondents, especially Hispanics, view Hispanic origin as a racial designation rather than an indicator of ethnicity, and expect to see it as a response option to the race question. As a result, a number of Hispanics reported as “Other” in the 1980 census and as “Other race” in the 1990 census. Research conducted since 1987 has suggested that placing a Hispanic origin category in the race question and adding a write-in line for ancestry may reduce the problem of nonresponse to the Hispanic-origin and ancestry questions. To verify this research, the RAETT included a combined, two-part, question on race, Hispanic origin, and ancestry.

The RAETT tested two versions of a combined question. Both provided response boxes for the current OMB race groups, for Hispanic origin, and for “Some other race.” Both also included a write-in line for American Indian and Alaska Native tribe. Part A had two variants; the first version included a multiracial category while the second included an instruction to respondents to “mark one or more.” Part B of the question asked respondents to report their “ancestry or ethnic group” in write-in lines. The objective of Part B was to determine how detailed Asian and Pacific Islander and Hispanic-origin groups would be reported. Additionally, the test sought to determine if respondents choosing the “Multiracial/biracial” category would provide additional information about their racial identification in the write-in lines. Among the key findings of the RAETT were:

- In every targeted sample, the nonresponse rate was lower for each of the combined questions than for the corresponding separate Hispanic-origin and race questions.

⁹⁴ In the 1990 census, 40 percent of the Hispanic respondents reported in the “Other race” category because many viewed themselves racially as Hispanic and did not identify with 1 of the 4 race categories.

- The combined race and Hispanic-origin questions elicited high levels of multiple response in the Hispanic targeted sample. On the version that asked respondents to “mark one or more” races, more than 90 percent of the multiple responses involved Hispanic origin and a race group.
- When all responses of Hispanic (either Hispanic alone or Hispanic in combination with any other response) were added together, there was no statistically significant difference in the percent reporting Hispanic between a combined question and separate questions on Hispanic origin and race.
- The ancestry write-in lines on the two-part question with the “multiracial” category did not provide percentages of either the detailed Asian or Pacific Islander groups or of the detailed Hispanic groups in the respective targeted samples. In contrast, the write-ins to the ancestry component of the combined question with the “mark one or more” instruction provided a detailed distribution of Asian and Pacific Islander groups in the Asian and Pacific Islander targeted sample that was statistically similar to that on the corresponding separate race question.

The fourth purpose of the RAETT was to test alternative terminologies, classifications, and formats in the race question. This portion of the test examined four issues and concluded that:

- Spelling out “American” (instead of using “Amer.”) in the “American Indian or Alaska Native” category did not affect reporting.
- Substituting “Native Hawaiian” for “Hawaiian” and listing this category immediately after the “American Indian and Alaska Native” category increased reporting as “Hawaiian.”
- Alphabetizing the Asian and Pacific Islander groups after “Native Hawaiian” had no effect on the total percentage reporting as Asian and Pacific Islander in that targeted sample.
- Allowing respondents to identify as “Guamanian or Chamorro” rather than as “Guamanian” yielded results for which there were no significant statistical differences.

1996 COMMUNITY CENSUS

The 1996 Community Census took place in seven tracts in Chicago, IL, and in the American Indian reservations of Acoma, NM, and Fort Hall, ID. The community census tested the simplified enumerator questionnaire (SEQ), a questionnaire proposed for Census 2000 nonresponse follow-up operations. Additionally, the community census used administrative records to augment the Integrated Coverage Measurement (ICM) procedures.

The Chicago test site was the largest of the three with a mailout of 9,824 questionnaires. The Fort Hall and Acoma Reservations had 1,903 and 935 questionnaires delivered, respectively. Two questionnaire types, DT-1A (rosterless) and DT-1B (extended roster) were included in the test. Replacement questionnaires were not mailed.

Test site mail return rates for occupied housing units varied from a low of 39.0 percent in Acoma, to a high of 47.7 percent in Fort Hall. The Chicago test site had a mail return rate of 41.9 percent.⁹⁵

Simplified Enumerator Questionnaire⁹⁶

An interdivisional team at the Census Bureau developed the SEQ by making changes to the enumerator questionnaire used in the 1995 Census Test. These changes included:

- No longer requiring enumerators to fill sex in a separate column.
- Incorporating a household screener question for origin.
- Revising the way the race question was asked.

⁹⁵ Kenneth E. Merritt, U.S. Census Bureau, Decennial Statistical Studies Division, “1996 Community Census Results: Mail Response Rates for the 1996 Community Census,” Memorandum No. 21, April 6, 1998.

⁹⁶ Michael Tenebaum, U.S. Census Bureau, Decennial Statistical Studies Division, “1996 Community Census Results: Evaluation of the Simplified Enumerator Questionnaire Based on Debriefings and Focus Group Results,” Memorandum No. 1, June 2, 1997.

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- Rewording the coverage questions.
 - Revising the continuation sheet for households with more than five household members.

Enumerators using the SEQ during the community census found that despite some minor problems, the questionnaire was easy to use and worked well. The overall format, which involved a topic-based approach, was well received and most of the enumerators were comfortable using the questionnaire. Enumerators with 1990 census experience noted that the SEQ was a substantial improvement over the questionnaire used during the 1990 census nonresponse follow-up operations.

Use of American Indian Administrative Records⁹⁷

The 1996 Community Census tested the use of administrative records to augment the Integrated Coverage Measurement (ICM) procedures. Building on experience gained in the 1995 Census Test, the 1996 Community Census attempted to acquire, generally, only national files. Since American Indian reservations were not included in the 1995 Census Test, Fort Hall and Acoma were chosen so that ICM procedures could be tested on reservations along with testing tribal rolls as an administrative list to be used in the census.

The use of administrative records in the 1996 test differed slightly from their use in the 1995 Census Test (see above section, “1995 Census Test”). As in 1995, all administrative lists were combined and unduplicated to create one database of administrative records persons for each census site. In 1995, the Census Bureau conducted the ICM interview comparing the new ICM roster to the census and then compared the final roster to the administrative records database. For 1996, unduplicated administrative records persons⁹⁸ who could be assigned to a census housing unit were included in the computer-assisted personal interviewing (CAPI) instrument. By doing this, the Census Bureau expected to obtain the most complete household roster possible during the ICM interview.

Generally, the Census Bureau expected that the acquisition of tribal rolls would be beneficial in a number of ways, the most notable being the possible reduction of the undercount in the two American Indian sites involved in the community census. The Census Bureau also used the test as an opportunity to match tribal rolls to other administrative lists, including Internal Revenue Service and Medicare files, to determine what, if any, additional coverage benefit the tribal rolls could provide when compared to these national files.

Although the Census Bureau anticipated learning much about the benefits of tribal records for administrative list building, the outcome of the 1996 Community Census was entirely different. The Census Bureau found that negotiations with tribal governments were quite lengthy despite some willingness to cooperate. On the Fort Hall Reservation, the negotiations did not produce an agreement. As a result, the Census Bureau was unable to acquire the tribal rolls or any other administrative lists from the Shoshone-Bannock Tribes of the Fort Hall Reservation. After lengthy negotiations, the Census Bureau did gain access to the tribal enrollment record for the Pueblo of Acoma; however, it arrived too late to be included in the ICM use of administrative records in the census test. Access to the Food Stamp or Food Distribution Program records on Indian reservations was not allowed.⁹⁹

⁹⁷ Sandra Lucas, U.S. Census Bureau, “1996 Community Census Results: Acquisition of Tribal Rolls for Census Use in the 1996 Community Census in American Indian Site,” Memorandum No. 3, Administrative Records Research Staff, June 2, 1997. See also, Elizabeth M. Sweet, “Using Administrative Record Persons in the 1996 Community Census,” *Proceedings of the Survey Research Methods Section*, American Statistical Association, 2000, pp. 416–21.

⁹⁸ The administrative records persons were not a source of direct person adds to the census counts.

⁹⁹ Both tribal governments appeared to carefully consider the request to acquire their tribal rolls and other administrative lists. The Census Bureau requested a response from each tribal government of approximately 1 month from the date of the original request. It was more than 2 months before the first definitive response. Both tribal governments expressed concern about the privacy of their records in Census Bureau hands. Furthermore, they expressed doubt that their records would be useable by the agency. As a result, the Shoshone-Bannock Tribes (Fort Hall) denied access. Although the Pueblo of Acoma Tribe eventually consented to the use

As a result of its experience trying to access American Indian tribal records during the 1996 Community Census, the Census Bureau concluded that changes must be made when dealing with the nation's autonomous American Indian and Alaska Native governments. The lessons learned (which would later be integrated into the Census 2000 Dress Rehearsal and Census 2000 programs) included:

- Allowing a longer lead time to negotiate for tribal rolls and other tribal records.
- Preparing a letter from the Census Bureau's Director to the tribal governments' highest elected official requesting cooperation and the use of tribal records.
- Preparing materials specifically for American Indian and Alaska Native sites that clearly explained the use of and need for tribal records in the census, and emphasized the privacy protections the Census Bureau would provide for tribal records.
- Preparing a draft memorandum of understanding to be used by the Census Bureau's regional offices when negotiating with tribal governments for their membership rolls and other tribal records.
- Conducting presentations by Census Bureau staff to tribal government officials and tribal liaisons that provide an overall view of census programs and operations and clearly show the integration of the different Census Bureau programs and operations.

1997 NATIONAL CENSUS TEST

As a result of fiscal year 1997 budget constraints, the Census Bureau's Management Integration Team¹⁰⁰ recommended halting the 1997 test. Survey operations were ordered to begin an "orderly shut-down" on July 3, 1997.

Plans for the 1997 National Census Test (NCT) included the mailout of eight versions of the census questionnaire to about 40,000 households. Five of these forms were scheduled to be versions of the short-form and the remaining three were versions of the long-form questionnaire. During the 1997 test, the Census Bureau planned to: (1) assess the effect of icons and benefit messages on response; (2) compare differences in response rates when using a booklet version and a fold-out short-form questionnaire; (3) determine if the absence of the roster on the long-form questionnaire would have an effect on response rates; and (4) assess the effect an "official" and a "marketing" envelope would have upon response rates.

The Management Integration Team authorized the transfer of the 1997 NCT budget to higher priority projects, including the Lockheed Martin Data Capture System 2000 contract and equipment and telecommunications expenses for the regional census centers.

DUAL-TRACK CENSUS PLANNING

The Census Bureau's plans and tests for Census 2000, through 1996, all assumed that the agency would use statistical sampling to supplement the returns from the census. By 1997, opposition to statistical sampling by the congressional majority was steadily mounting, and there was a push to require the Census Bureau to develop a plan that relied solely on traditional enumeration techniques.

In the fall of 1997, with the threat of a stalemate between Congress and the administration in the debate over the use of statistical sampling in the census, a compromise was reached in the fiscal year 1998 Department of Commerce appropriations bill that President Clinton signed into law.¹⁰¹

of their records, the delay precluded their use during the 1996 Community Census Test. Despite the delay in receiving the records from the Pueblo of Acoma, they were later used for further research into the type of information contained on the list and its coverage.

¹⁰⁰ The Management Integration Team (MIT), an assembly of the division chiefs involved with census planning.

¹⁰¹ Public Law 105-119, 105th Cong., 1st Sess. (1997), Departments of Commerce, Justice, and State, the Judiciary and Related Agencies Appropriations Act of 1998.

The legislation allowed the Census Bureau to continue to plan for the use of sampling, but it also required the agency to plan for a census without statistical sampling. Thus, the Census Bureau was required to undertake dual-track planning.¹⁰²

The law also sought to provide an opportunity for expedited judicial review of the legality and/or constitutionality of using sampling methods to produce population figures for apportionment or redistricting purposes. Additionally, the statute established the U.S. Census Monitoring Board¹⁰³ to oversee the planning and conduct of Census 2000. Also as part of the compromise, but not contained in the text of the enacted legislation, the agency had to modify its plans for the Census 2000 Dress Rehearsal (conducted in 1998) to include one site that would test methods that would be used in a nonsampling census.¹⁰⁴

THE CENSUS 2000 DRESS REHEARSAL

The purpose of the dress rehearsal program was to test all of the various operations planned for Census 2000 to ensure that they would work properly in a full-scale enumeration. The agency regarded a good dress rehearsal as crucial to the success of Census 2000 and sought to make sure that the dress rehearsal was as much like the actual census as possible. Toward that end, the dress rehearsal included operational testing of the headquarters, regional census center, local census office, and data capture center procedures and systems. Census Day for the dress rehearsal was April 18, 1998.

While the Census Bureau did as much as it could to simulate all of the procedures involved in a full-scale census, there were some differences. For instance, the dress rehearsal did not have a 100 percent block canvass of the address list as was conducted during Census 2000. Despite such limitations, the dress rehearsal did help the Census Bureau evaluate its plans for Census 2000.¹⁰⁵

The Census Bureau chose three test sites—Columbia, South Carolina and 11 surrounding counties; Menominee County in northeastern Wisconsin, and Sacramento, California—that it believed provided a good operational demonstration of Census 2000 procedures and systems.

The first site, Columbia, SC, and eleven surrounding counties (Chester, Chesterfield, Darlington, Fairfield, Kershaw, Lancaster, Lee, Marlboro, Newberry, Richland, and Union), represented an area that had a mix of house number and street name, rural route, and box number address types. This site had a relatively large proportion of African Americans. While the Census Bureau originally planned to use statistical sampling in this area to test how well these procedures reduced the differential undercount, the agency chose to use this site to test traditional enumeration methods to comply with the agreement reached with the congressional leadership.¹⁰⁶ This area had a 1990 population of 655,066, and a housing count of 253,285.

The second site, Menominee County, WI, was selected because it contained the Menominee American Indian Reservation and had been suggested for inclusion in the test by the Census Advisory Committee on the American Indian and Alaska Native Populations. It was chosen by the Census

¹⁰² In late November 1997, Congress passed H.R. 2267, the Commerce, Justice, State Appropriations Act and it was signed by President Clinton. The President originally vetoed H.R. 2267; however, he agreed to sign it after a compromise regarding the issue of Census 2000 was worked out between the administration and the House of Representatives.

In the compromise language of H.R. 2267, the House created the right to bring a lawsuit in Federal District Court (to be heard by a three-judge panel, at least one of whom was a circuit judge) by the two Houses of Congress, Representatives, Senators, and any resident of a state whose congressional representation could be changed as a result of the use of a statistical method. In addition, it allowed for a particular lawsuit to be filed by the Speaker, "on behalf of the House of Representatives," with the Office of the General Counsel of the House of Representatives to represent the House in such civil action. Therefore, the House was funding the Speaker's lawsuit. Furthermore, H.R. 2267 allowed for any party to such a lawsuit to appeal the Federal District Court ruling directly to the Supreme Court, bypassing the U.S. Court of Appeals.

¹⁰³ The U.S. Census Monitoring Board was composed of appointees from the administration and the House and Senate majority leadership.

¹⁰⁴ For a more detailed summary of the provisions of P.L. 105-119 representing the compromise on the sampling issue and the outcome of the court cases regarding sampling, see Chapter 11, "Legal Issues."

¹⁰⁵ Bureau of the Census, "Census 2000 Dress Rehearsal Report Card: Evaluation of the Standards for Success," February 1999.

¹⁰⁶ See earlier discussion on dual-track planning.

Bureau to test how well sampling reduced the differential undercount on American Indian reservations; these areas had a 12 percent net undercount rate in the 1990 Census. The 1990 population for this area was 3,890, and the housing count was 1,742.

The third site, Sacramento, CA, was chosen for its population diversity. The site offered the opportunity to apply sampling techniques that were designed to reduce the differential undercount and to test how well the agency's enumeration plan for Census 2000 would capture all components of the population. Another reason that the Census Bureau chose Sacramento was that it was a primary media market, which allowed the agency to analyze the advertising campaign. The city's population in 1990 was 369,365, with a housing count of 153,362.

The Census Bureau began preparing for the dress rehearsal during the summer of 1996. The agency started to work with local officials and community-based organizations in each of the three sites and began to plan and build the various infrastructures needed for the dress rehearsal. These activities included refining the geographic database, building and refining the address list, and working with community and tribal organizations to plan outreach and promotion efforts.

Master Address File (MAF)

A master address file (MAF) was created that included the address or geographic location for every housing unit and group quarters in the Census 2000 Dress Rehearsal sites. The foundation for the MAF was the 1990 Census address list—the 1990 Address Control File (ACF). The ACF was merged with the delivery sequence file (DSF) of the U.S. Postal Service (USPS), and the combined address file was supplemented by information provided by local officials and by address listing operations.¹⁰⁷ In 1997, the MAF building process was modified to rectify several problems. However, many of these modifications were not in place by the dress rehearsal (for more on the MAF development, see Chapter 8). Hence, the MAF building process developed for the dress rehearsal was not the same as the one used in Census 2000. The main operations that were added to the MAF building process for Census 2000 were a 100 percent block canvass for city-style address areas and a quality assurance review in non-city-style areas. In block canvassing, listers checked the addresses in their assigned areas against those on the MAF, making additions and deletions as necessary.

In addition to the 1990 address control file (ACF) and the Postal Service's delivery sequence file (DSF), the pre-census MAF development drew on data from several other operations. These included Targeted Multiunit Check, Targeted Canvassing, Local Update of Census Addresses, Postal Validation Check, and Address Listing, among others.

The Targeted Multiunit Check compared discrepancies between the 1990 ACF and the DSF. Enumerators visited the street addresses at these multiunit dwellings to ensure that the agency had the correct number of units. The operation identified fewer than 300 new housing units out of 31,681 housing units that enumerators canvassed at both the Sacramento and South Carolina sites.

The Targeted Canvassing operation relied on the expertise of local officials to identify blocks that were likely to have hidden housing units. Field staff walked these blocks in Sacramento and added 756 housing units as a result of canvassing 19,477; in South Carolina, this operation added 111 units after canvassing 5,803. Since there was a 100 percent block canvass for the MAF used in Census 2000, the Targeted Canvassing operation was dropped.

One of the major programs in the MAF building process was the Local Update of Census Addresses (LUCA) review, which took place between August 31 and September 17, 1997. In South Carolina, 31 of the 60 governmental entities, representing 98 percent of the area's 1990 housing units, participated. The city of Sacramento recommended additions and corrections to existing addresses and so did Menominee's tribal governments. In South Carolina, the LUCA operation accepted 43.2 percent of the 12,414 deletions, 56.3 percent of the 26,983 corrections, and

¹⁰⁷ U.S. Census Bureau, "Census 2000 Dress Rehearsal Evaluation Summary," August 1999, p. 2.

12.6 percent of the 30,942 additions that were submitted. In Sacramento, the agency accepted 86.5 percent of the 4,528 corrections and 5.3 percent of the 2,918 additions submitted. In Menominee, the agency accepted 60.7 percent of the deletions, 97.6 percent of the 289 corrections, and 100 percent of the additions submitted.

The dress rehearsal produced useful information about how to run the LUCA program. Inadequate instructions and procedures in the dress rehearsal LUCA resulted in large numbers of locally proposed address adds, corrections, and deletes that did not meet the agency's requirements. Submissions from the local governments included errors such as incomplete address information and out-of-jurisdiction changes.

One serious problem was the confusion experienced by local officials in non-city-style areas as they tried to review and verify the address descriptions provided by the Census Bureau. For example, "Rt. 2, Box 19" was difficult to match with "white house with green shutters and picket fence." This led the Census Bureau to revise its LUCA procedures for areas where non-city-style addresses occur. Another problem was that the Census Bureau provided local officials with addresses from surrounding jurisdictions in expectation that this would help local officials ensure all addresses were covered. Instead, this operation led to substantial confusion on the part of the local officials and they tried to delete the units outside of their jurisdictions.

Several changes were applied to the LUCA process through a second round of updates from local and tribal governments. In this second round of updates, time constraints kept the field staff from doing a thorough review and the Census Bureau generally accepted everything submitted. This was problematic because it led to an erroneous number of addresses in the MAF, which were costly in dollars, staff resources, and census errors. Changes were made to the LUCA program for Census 2000 to incorporate the information from the dress rehearsal. The Census Bureau changed the approach to LUCA for areas with non-city-style addresses by allowing LUCA reviewers only to challenge block counts rather than add, delete, and correct individual addresses in blocks with non-city-styles. These areas did, however, continue to be provided the individual addresses, regardless of their being non-city-style, for review.¹⁰⁸

One challenge that the agency faced during the dress rehearsal was whether it would be able to process and add new city-style addresses from the Postal Service's Postal Validation Check prior to questionnaire mailout. For this operation, the USPS returned information about addresses that the MAF was missing, addresses that needed corrections, and addresses that did not exist. Only information about missing addresses was used. The operation led to a significant number of deletions: in Sacramento, 75.7 percent of the 12,551 addresses were deletions, while 67.3 percent of South Carolina's 4,856 addresses covered by the operation were deletions. The timing of the Postal Validation Check meant that block codes were not assigned to some new addresses in time to put the questionnaires in the mail stream. So, some addresses were included for the first time in the nonresponse follow-up operation.¹⁰⁹

The update/leave operation, conducted in Menominee and parts of South Carolina, was another source of addresses. For this operation, enumerators canvassed each block in their area, matching, updating, and deleting addresses from their address list and delivered a dress rehearsal questionnaire to each address. Of the 2,060 listings from Menominee, there were 96 new addresses, 566 corrections, and 87 deletions. Of the 66,704 addresses listed in the South Carolina site, 4,331 were new addresses, 7,543 were corrections and 4,225 were deletions.¹¹⁰

Be Counted forms provided another source of late address adds. Many of the addresses added by this operation were not geocoded¹¹¹ in time to be included in the dress rehearsal at all. In the Sacramento site, 84.3 percent of the 1,575 Be Counted cases were properly geocoded, but only 68.3 percent of these were geocoded in time for inclusion in the dress rehearsal. In South Carolina, 91.7 percent of the 661 cases were geocoded in time for inclusion, while in Menominee

¹⁰⁸ U.S. Census Bureau, "Census 2000 Dress Rehearsal Evaluation Summary," August 1999, pp. 5–6.

¹⁰⁹ Ibid., p. 6.

¹¹⁰ Ibid., p. 23.

¹¹¹ Geocoding is the process of assigning an address location identified by one or more geographic codes, e.g. a census block.

76.9 percent of the 13 cases were completed in time. Identifying this problem during the dress rehearsal allowed the Census Bureau to correct it in time for Census 2000.

Dress rehearsal evaluations identified several deficiencies in the MAF building process that could be corrected for Census 2000. However, few of the individual operations were assigned variables that would have identified how each contributed to the overall address list. Address adds and deletes were not linked to specific operations, so the agency was unable to establish a base against which to measure the relative impact of each operation. This problem was corrected for Census 2000.

The Census Bureau planned to conduct a housing unit coverage survey to test the completeness of the MAF but canceled it due to concerns about diverting resources from Census 2000 planning. The agency also recognized that it would gain little of value from an evaluation of the survey, because the survey process was thoroughly revised for Census 2000. Instead of relying on the housing unit coverage survey, the agency generated a preliminary picture of housing unit coverage by analyzing the results of two different operations. The first results came from the initial housing unit match of the Integrated Coverage Measurement/Post-Enumeration Survey (ICM/PES) programs (see below for details). This operation, which took place in the spring of 1998, matched and reconciled the housing units from the MAF with units identified on an independent address list created for ICM/PES. The second involved studying the volume of added and deleted units following that initial match. Taken together, the results of these two operations provided at least a limited indication of housing unit coverage.

Using the returns from these two studies, the Census Bureau evaluated MAF coverage for each site against standards that were based on the 1990 Housing Unit Coverage Study. The agency determined that in Menominee, the MAF coverage was at least as good as the net housing coverage goal of 96.8 percent or better; the net undercount rate there was 0.0 percent. For the Sacramento site, the Census Bureau was unable to determine whether it had met its net housing coverage goal of 98.5 percent or better; the site had a net overcount of 0.5 percent, yet there were indications that the standard may not have been met. The number of additions and deletions following the initial housing unit match indicated that the net undercount could have been sufficiently changed by subsequent operations to prevent the agency from meeting the standard. The MAF of the South Carolina site did not meet the coverage goal of at least 98.5 percent; the net undercount of housing units after the initial housing unit match was 10.5 percent. These results reinforced the agency's decision to redesign the MAF building process.

The lack of a 100 percent block canvass was partially responsible for deficiencies in the dress rehearsal MAF for mailout/mailback areas; this operation was conducted for Census 2000. The Census Bureau also added quality assurance for non-city-style address listing and redefined the delete rules, both of which improved MAF coverage and quality for Census 2000.

Mailing Strategy/Response Options

The dress rehearsal employed the same response options (with the exception of Internet response) that were later used during Census 2000. In addition to mailout/mailback and update/leave, the dress rehearsal used Be Counted forms that were available in several public locations for people to pick up, fill out, and mail back. Respondents also could provide their information over the telephone through the Telephone Questionnaire Assistance (TQA) Program, which used a toll-free telephone number. Less than 1 percent of respondents to the dress rehearsal were counted by these two alternative response options.

Two basic questionnaire delivery methods were used during the dress rehearsal. The first was mailout/mailback, which covered city-style addresses. Each address was sent four pieces of mail: first, an initial notification letter that alerted people that a census questionnaire was coming in time for the April 18, 1998 Census Day; next, the questionnaire itself; after that, a thank you/reminder postcard; and, finally, a second "replacement" questionnaire. This technique was used in Sacramento, CA, and for the portion of the South Carolina addresses with city-style mail delivery (79 percent of addresses).

In Sacramento, questionnaire delivery began on March 28, 1998, while questionnaire delivery to the South Carolina site began on March 24, 1998. The reminder cards and replacement questionnaires were sent between April 3 and April 17, 1998, to all households in the mailout/mailback universe.

The second method, update/leave, was used in areas with rural routes, box numbers, or other non-city-style addresses. For this operation, Census Bureau employees delivered the questionnaires and concurrently updated agency maps and address registers to include any new street addresses. This operation was used in the rural parts of the South Carolina site and all of the Menominee, WI, Indian Reservation. The agency used both long and short questionnaires for each of the sites and delivered them in the same proportion that was used during Census 2000. Respondents were instructed to return completed questionnaires in the mail. As with the mailout/mailback areas, update/leave areas were sent an advance notification letter prior to receipt of their census questionnaire and a thank you/reminder card following it. The advance notification and the reminder card were delivered by the U.S. Postal Service and were addressed to "Postal Patrons" in the update/leave areas. Unlike the mailout/mailback areas, no second questionnaires were delivered to these addresses. The questionnaires were delivered beginning March 14, 1998, and reminder cards were sent between April 7 and April 11, 1998. In Menominee, the mail response rate was 39.4 percent (all update/leave). The update/leave portions of the South Carolina site had a 47.8 percent response rate.

Following the dress rehearsal, the Census Bureau decided not to employ the replacement questionnaire in Census 2000.¹¹² For each of the sites, a majority of all mail respondents returned their completed questionnaire by Census Day; 74.9 percent in Sacramento, 74.6 percent in South Carolina, and 78.8 percent in Menominee. Most respondents used the original questionnaire since the replacement was not delivered until around Census Day. While the replacement questionnaire increased the overall response rate, 56 percent of those that were returned to the agency came from households that had also returned the initial questionnaire. Of the responses from households that returned both, 86.8 percent in Sacramento and 88.3 percent in South Carolina were identical on the initial and replacement. The improvement in the mail response rate due to the replacement questionnaire was just over 8 percent in South Carolina and about 7.5 percent for Sacramento. However, the sheer volume of duplicates that the Census Bureau believed could have been returned from a general mailing of replacement questionnaires threatened the quality of Census 2000.

The Census Bureau also tested non-English-language questionnaires during the dress rehearsal. To areas with high concentrations of Spanish or Chinese households, the agency sent both the English and non-English questionnaires. The Spanish-language questionnaire was returned by 4.9 percent of households that received a Spanish questionnaire. The Chinese version was returned by 7.1 percent of the households that received a Chinese questionnaire. The small proportion of respondents who used the non-English questionnaire demonstrated that either the agency needed better methods to select the targeted areas or that special language forms were not needed by many respondents. The agency experienced difficulties with matching English- and non-English-language questionnaires with the same identification codes and placing both in a single envelope. This was a labor-intensive and time-consuming process that was prone to error, so the Census Bureau decided not to conduct a similar operation for Census 2000. Instead it opted to mail an English-language questionnaire to all households and offer the option of requesting 1 of 5 different language questionnaires by responding to the advance letter. The five languages were Chinese, Korean, Spanish, Tagalog, and Vietnamese. The agency also planned to have language guides¹¹³ in at least 49 languages for Census 2000.

During the dress rehearsal, the Census Bureau tested another response option, Be Counted forms. These forms offered a response option to people who may not have received a census questionnaire or who believed that they were not included on one. Be Counted forms also allowed people

¹¹² Coupled with the experience of the dress rehearsal, replacement questionnaires also were not employed because of the time, space, and cost requirements of identifying, preparing, and mailing replacement questionnaire packages.

¹¹³ Language guides assisted non-English speaking households by walking them, question-by-question, through the questionnaire to enable them to provide their responses.

who had no usual residence on Census Day to be counted in the census. Local government officials, community groups, and local census officials helped the agency to identify locations at which to make the Be Counted forms available; these locations included local businesses, community organizations, libraries, post offices, grocery stores, and churches. These forms were printed in English, Spanish, Cantonese, Vietnamese, Mien, and Russian. The Be Counted campaign began on April 16, 1998, for all three sites and ended on May 1 for Sacramento and Menominee, and on May 14 for South Carolina. There were 218 Be Counted distribution sites for Sacramento, 183 for South Carolina, and 16 for Menominee.

When Be Counted responses were received, they were geocoded and verified. Addresses for individuals listed on the form were searched to guard against the possibility of duplicate enumerations. Those Be Counted forms without an address and for which the respondents indicated that they had no usual address on Census Day were included in the service-based enumeration process. Overall, 1,707 people¹¹⁴ who otherwise would have been missed, were added by Be Counted forms. In Sacramento 1,575 Be Counted forms were submitted which resulted in 907 geocodable addresses; of these, 343 had information for 870 people who would have been missed. In South Carolina, there were 783 responses with 606 geocodable addresses; of these, 337 contained information for 821 people who would have been missed. In Menominee, 21 responses yielded 10 geocodable addresses; of these, 5 had information that added 16 people who would have been missed. In addition to the 1,707 people added at these addresses, 85 people were added by Be Counted forms via the service-based enumeration operation.¹¹⁵

Fewer people than anticipated were enumerated by Be Counted forms, in part due to problems with the geocoding, processing, and unduplication operations that removed responses for reasons such as “nonexistent housing unit” or “duplicates another response.” Many forms did not arrive in time to be included in the Dress Rehearsal because it took too long to process them prior to non-response follow-up. While these forms were discarded, many of the addresses may have received a visit during nonresponse follow-up. For Census 2000, the Census Bureau improved the way it accounted for Be Counted forms by improving or automating several operations, particularly check-in, geocoding, and field verification of addresses that did not match those on the MAF. The agency also consulted with its partners to determine the best locations for Be Counted forms. One residual issue was that Be Counted forms had higher item nonresponse rates which decreased data quality when compared to responses from other mail returns.¹¹⁶

Telephone Questionnaire Assistance (TQA) offered another response option during the dress rehearsal. This operation (managed and staffed by Census Bureau employees during the dress rehearsal), began at the same time as update/leave and remained available through nonresponse follow-up. The TQA was conducted from the Census Bureau’s Tucson, Arizona, telephone call center and served callers from all sites in the same manner; it was not designed to differentiate among callers from the three dress rehearsal sites.

The TQA allowed the agency to field questions from the public regarding what the census was, why it was being conducted, and how to complete the questionnaire. Respondents could use the system to request that a form be sent to them, or they could provide their short-form questionnaire data by completing a telephone interview with a census operator. There were three components of the TQA operation. Calls first were fielded by an Interactive Voice Recognition (IVR) system that was designed to collect an address so that a questionnaire could be sent to the caller. For callers who required direct assistance, the automated system re-routed the call to an interviewer

¹¹⁴ A coding error resulted in some people being incorrectly attributed to Transient Night (T-Night) operations instead of Be Counted. See “Service-based enumeration.”

¹¹⁵ U.S. Census Bureau, “Census 2000 Dress Rehearsal Evaluation Summary,” August 1999, pp. 40–41.

¹¹⁶ Although the data quality from Be Counted forms was less when compared to mail returns, the Census Bureau deemed it more important to deal with the quality issue and count these people as they likely would have been missed by other enumeration methods.

who evaluated the reason for the call, coded the reason, and provided assistance to the caller. Census information could be provided over the telephone for short-form questionnaire recipients.¹¹⁷

The automated system was able to collect addresses from callers so that replacement questionnaires could be sent. The system used three methods to collect addresses. The first used the caller's telephone number to match to a database of residential addresses; these callers merely had to verify their house number and street name. The second method prompted the caller to provide a complete mailing address via the IVR, while the third required an operator to collect the complete address. Overall, these three methods yielded correct addresses 89 percent of the time (91.3 percent for telephone number match, 89.3 percent for those taken by voice capture, and 82.2 percent of those taken by an operator). The first two methods were limited to capturing city-style addresses, which were more likely to match to the MAF. Of the callers who requested a form and who had a city-style address, 69 percent returned a questionnaire, though most returned their original form. About 20 percent of all callers requested a questionnaire; 17 percent made the request through the IVR, while the remaining 3 percent did so through an operator. Of those requesting a questionnaire, 85 percent returned the original questionnaire that was mailed to their address rather than the replacement they requested. Very few opted to provide their information over the telephone through an operator; in all three sites combined, there were just over 100 TQA interviews. Despite the low usage by respondents, the Census Bureau's stakeholders requested that the system be maintained for Census 2000.

The Census Bureau used these two alternative data collection methods (Be Counted forms and Telephone Questionnaire Assistance) in order to reach populations that were expected to have language difficulties and to provide a last resort for people who believed that they had been missed by the count. The agency feared that when it enumerated people through these alternative methods that it would lose long-form data. While TQA respondents were assigned the long-form questions on a sample basis, Be Counted forms were all short-form questionnaires. The overall loss of sample data from alternative data collection methods and other reasons was 0.9 percent in South Carolina, 1.2 percent in Menominee, and 1.4 percent in Sacramento. However, the loss by alternative data collection methods alone was limited; 0.0 percent for South Carolina and Menominee, and 0.4 percent in Sacramento.¹¹⁸

Advertising

In order to raise awareness and stimulate response to Census 2000 among the general population and hard-to-enumerate groups, the Census Bureau planned an extensive advertising and marketing campaign. Census 2000 marked the first time that the Census Bureau decided to use paid advertising (in earlier censuses, the agency relied on *pro bono* advertising to encourage response). While the advertising campaign and marketing program were used in all three test sites, quantitative evaluations of the ad campaign were carried out only for Sacramento and South Carolina. The advertising program included advertisements delivered through television, radio, newspapers, magazines, and out-of-home media (billboards, bus shelters, posters, mobile billboards, and ads on shopping carts, in beauty salons, convenience stores, and check-cashing establishments, etc.). The Census Bureau also conducted a special school-based public information campaign.

Evaluations covered two aspects of the campaign's effectiveness. The first studied changes in census awareness, attitudes, and knowledge before and after the campaign. The second analyzed the relationship between exposure to the advertising campaign and likelihood of returning a completed questionnaire. These evaluations determined that the campaign both increased awareness and demonstrated that those who expected a census questionnaire were more likely to return it. While the evaluations concentrated only on the efforts of the paid advertising campaign, the effect

¹¹⁷ As the cut-off date for telephone nonresponse follow-up neared, callers were encouraged to submit their information by telephone (instead of mailing a replacement questionnaire) so as to avoid the household receiving a mailed replacement questionnaire and a nonresponse follow-up enumerator's visit at approximately the same time and risking duplication of the household.

¹¹⁸ Zakiya T. Sackor, "Census 2000 Dress Rehearsal," *Proceedings of the Survey Research Methods Section*, American Statistical Association, 1999, pp. 761–65.

of other promotional activities certainly influenced people's awareness of the census. These activities included independent promotional and advertising efforts sponsored by local partners and the receipt of census materials (including the pre-notice letter, census forms, and the reminder postcard).

Before and after the media campaign, the Census Bureau conducted a telephone survey of both Sacramento and South Carolina residents to determine their awareness, attitudes, and knowledge of the dress rehearsal. Within the sample households, the household member who was responsible for opening the mail was interviewed. Interviewing began on February 10, 1998, leaving only 19 days to complete the interviews before the media campaign began. The pre-campaign survey allowed for only a short field collection period, so as a result the response rates were much lower than those achieved by the post-campaign survey. For the pre-campaign survey, the response rate in Sacramento was 25 percent and 28 percent in South Carolina. In contrast, the post-campaign response rate was 54 percent in Sacramento and 64 percent in South Carolina. The awareness study showed that in Sacramento, people's awareness of the census increased from 28 percent (158 people out of 565 respondents were aware) before the ad campaign to 80 percent (1,203 people out of 1,504 respondents) after it. In South Carolina, awareness rose from 29 percent (237 people out of 817 respondents were aware of the census) before the campaign to 89 percent (1,340 people out of 1,506 respondents) after it. These results were in line with the agency's goal of increasing awareness by at least 30 percent in both sites.

The advertising campaign began the first week of March and ran through the last week of June, for some media. While awareness was highest among non-Hispanic Whites and those with higher levels of education and income, significant proportions of low income and education groups and targeted race and ethnic groups were found to have been exposed to the campaign. The most effective medium for reaching respondents was television, reaching larger proportions of each of the targeted subgroups than any of the other media. The television campaign reached 62 percent of respondents in Sacramento and 68 percent of respondents in the South Carolina site. Meanwhile, magazine ads were the least effective medium, reaching only 13 percent of the population in Sacramento and 16 percent in South Carolina.

The study also found a positive relationship between reported advertising exposure and level of census knowledge, even when controlling for other factors such as race/ethnicity, income, and education. However, non-Hispanic Whites still had significantly higher levels of census knowledge after the campaign compared to the targeted race and ethnic groups. In addition to awareness about the census, level of civic participation and expectation of receiving a census form both were strongly associated with the likelihood of mailing back the completed questionnaire. While the agency did not find a direct relationship between advertising and response behavior, the analysis suggested that advertising may have had an indirect effect on behavior by making people expect the questionnaire, which in turn was associated with a higher likelihood of returning it.

Data Collection and Field Infrastructure

Not all households responded to the dress rehearsal via their original questionnaire or through alternative response options such as Be Counted forms and Telephone Questionnaire Assistance. The Census Bureau conducted a nonresponse follow-up operation to collect census information from these nonresponding households.

Finding and collecting data from nonrespondents was one of the most difficult and costly operations of the census. In order to obtain an accurate count of nonrespondents while reducing costs, the Census Bureau planned to employ statistical sampling. A budget agreement between Congress and the Clinton Administration (see "Dual-Track Census Planning") stipulated that one site had to use a full nonresponse follow-up, so sampling for nonresponse follow-up was used only in Sacramento.¹¹⁹

Housing units for which questionnaires were not checked in by May 7, 1998, were placed in the nonresponse follow-up universe for each site. The agency conducted a full nonresponse follow-up

¹¹⁹ The small size of the Menominee County, WI, population prevented sampling for nonresponse follow-up.

in South Carolina and Menominee beginning on May 14, 1998. The agency completed this operation on June 26, 1998, for Menominee, and on July 2, 1998, for South Carolina.

In Sacramento, nonresponse follow-up collected census data from only a sample of housing units in the nonresponding universe. The sample was designed so that each census tract reached a final completion rate of at least 90 percent. For example, a tract that reached an initial completion rate of 85 percent would be sampled at the rate of 1-in-3 nonresponding housing units in order for the final completion rate to reach 90 percent. Through statistical estimation techniques, responses from all of the other nonresponding households were derived from the sample responses. Households that were added to the address list too late to be sent a questionnaire were included in the nonresponse follow-up universe. The agency completed this operation in Sacramento, CA, on schedule on June 26, 1998.

Before applying sampling methods, the agency made a concerted attempt to contact nonresponding households. Enumerators were required to make six attempts to collect data, three by personal visit and three by telephone. If household residents were unreachable, enumerators were allowed to interview knowledgeable people who did not live in the housing unit to collect “proxy data.” If an enumerator was unable to get any data on a household, and was unable to determine whether it was vacant or occupied, they listed it as an “unclassified unit.” Final attempt procedures began once an area reached a 95 percent completion rate for nonresponse follow-up.¹²⁰

The dress rehearsal was the first time that enumerators specifically indicated that a response was obtained by proxy, hence it was the first time that the agency directly measured proxy use. While the agency hoped to rely on proxy data for no more than 6 percent of the nonresponding universe (based on 1990 census data), the actual rates were significantly higher. Proxy data were used for 20.1 percent of the occupied nonresponse follow-up universe in Sacramento, 16.4 percent in South Carolina, and 11.5 percent in Menominee.

In Sacramento, 8.9 percent of housing units in the nonresponse follow-up universe were enumerated during final attempt procedures, while the other two sites met the 5 percent standard that the agency established for final attempt cases.¹²¹ The rate was higher in Sacramento, CA, because enumerators failed to follow the operational rules for collecting final attempt data.¹²² Because of concerns about the low quality of proxy and final attempt data, the Census Bureau decided to review the procedures for trying to conduct nonresponse follow-up interviews with household members. As a result, the agency increased the training and quality assurance for nonresponse follow-up.

At the end of nonresponse follow-up, almost all housing units were classified as occupied, vacant, or deleted; only a very small proportion of housing units remained as unclassified. Due to the number of lost forms and problems with the data capture and data processing processes, the agency was unable to meet its goal, of no more than 0.05 percent of households listed as

¹²⁰ Once a local census office reached an average 95 percent rate of completion during the nonresponse follow-up operation, the regional director instructed the office to begin “final attempt” within 2 days. During “final attempt” enumerators made one final visit to nonrespondent addresses that had been visited at least two times and to some housing units for which only minimal data had been collected to complete as much of the questionnaire as possible. If an address was only visited once, an enumerator made up to two additional visits during “final attempt.” The intent of “final attempt” was to resolve all outstanding cases within a few days, but nonresponse follow-up was not over until a questionnaire was completed and checked into the local census office for every unit.

¹²¹ The rate for South Carolina was 3.2 percent and for Menominee, 0.1 percent.

¹²² Assuming that record keeping was accurate in Sacramento, CA, it appears that the “final attempt” procedures—part of nonresponse follow-up—were not properly followed. Greater than 5 percent (8.9 percent) of the nonresponse follow-up universe was enumerated during final attempt procedures. The intended rule was that final attempt procedures for each crew leader district within the dress rehearsal site were not to begin until 95 percent of the housing unit workload in that area had been completed.

Final attempt procedures were successful in South Carolina, as 3.2 percent of the housing units in the nonresponse follow-up universe had their information obtained during final attempt operations. In Menominee, either the final attempt procedures were not utilized or unnecessary, since only one questionnaire indicated that it had been completed during final attempt operations. [C. Robert Dimitri, U.S. Census Bureau, Decennial Statistical Studies Division, “Nonresponse Follow-up Operation,” Census 2000 Dress Rehearsal Evaluation Memorandum A1b, April 1999.]

unclassified. In Sacramento, 1.0 percent of the housing units in the nonresponse universe were unclassified; the unclassified rate for South Carolina was 1.1 percent, and in Menominee, it was 0.8 percent.

Service-based enumeration. The Census Bureau included a service-based enumeration during the dress rehearsal to collect data from people without housing who might have been missed by the traditional procedures applied to housing units and group quarters. Enumeration sites included emergency shelters, soup kitchens, and targeted non-sheltered outdoor locations, such as outdoor encampments. Individuals who submitted Be Counted forms that listed “no address on April 18, 1998” were included in the service-based enumeration universe. In general, the operation in the more carefully controlled sites appeared to be a successful way to include people without housing in the census. A total of 1,615 people were added through service-based enumeration across all three sites. In Sacramento, the Census Bureau enumerated 12 sites (11 shelters, one soup kitchen),¹²³ in South Carolina 19 (13 shelters, four soup kitchens, and two targeted non-sheltered outdoor locations [TNSOLs]) and 2 TNSOLs in Menominee.

Service-based enumeration took place between April 20 and 22, 1998, beginning with emergency shelters on April 20. At least one team of two enumerators went to each shelter, introduced themselves to the contact person, explained the enumeration process, and asked the contact person to make an announcement to encourage participation. Participants received a Privacy Act notice in a packet that also included a questionnaire, pencil, envelope, and for every sixth person, a long form. Respondents were asked to complete and return their questionnaires in the envelope provided.

Soup kitchens were enumerated during the day and evening of April 21, 1998. The Census Bureau sent teams of seven enumerators to each location, with multiple teams working at the larger locations. Upon arrival, the enumerators introduced themselves to the contact person, explained the enumeration process, and asked the contact person to make an announcement to encourage participation. Two members of the team conducted long-form interviews.

Enumeration at targeted nonsheltered outdoor locations took place on April 22, 1998. Census partners provided a contact person to visit each of these locations along with enumerators. No long forms were administered at these sites and enumerators were instructed to note age and sex if they were unable to complete an interview.

The agency developed procedures to handle duplicate questionnaires from individuals providing data from two locations. Questionnaires completed at a shelter were determined to be the primary source if a respondent provided data both there and at a soup kitchen or TNSOL. If respondents provided data at both a soup kitchen and a TNSOL, the more complete questionnaire was regarded as the primary source. People who responded via Be Counted forms were allocated randomly to shelters, soup kitchens, and TNSOLs for tabulation purposes. After enumeration and unduplication, 96.9 percent of the 1,193 respondents to the service-based enumeration in Sacramento were included in the dress rehearsal count; 86.1 percent of the 525 respondents in South Carolina were included, and 100 percent of the seven respondents from Menominee were included.

Coverage edit follow-up.¹²⁴ The Census 2000 Dress Rehearsal Coverage Edit Follow-up operation was a procedure to edit and correct enumeration data indicating household size on short- and long-form mail return questionnaires. Errors in the data on household size resulted either from data capture errors, caused by scanning or imaging problems, or from respondent errors. Data capture audit resolution, a computer edit and computer-assisted review process, was expected to resolve many, if not most, of the data capture errors affecting household size. The coverage edit follow-up was designed to correct respondent errors resulting from the inadvertent omission or duplicate listing of household members, the misunderstanding about who should be included on a census form, or from a general failure to completely and accurately fill out the census form.

¹²³ There were some TNSOL locations in Sacramento; however, they were incorrectly coded as Transient Night (T-Night) enumeration locations. See, U.S. Census Bureau, “Census 2000 Dress Rehearsal: Evaluation Summary,” August 1999, p. 56.

¹²⁴ U.S. Census Bureau, “Census 2000 Dress Rehearsal: Evaluation Summary,” August 1999, pp. 58–59.

Short-form questionnaire households needing coverage edit follow-up were identified by comparing the count of household members at the beginning of the questionnaire (short-form person count box) with the number of person panels filled plus the number of names entered on the short-form roster (for persons 6–12). On long-form questionnaires, the coverage edit compared the number of names on the household roster with the number of person panels filled. If these measures of household size did not agree and the data showed that there were less than six people in the household, the questionnaires failed the coverage edit and required follow-up. (Mail return questionnaires with six or more people were included in the large household follow-up [see below] and were ineligible for coverage edit follow-up.)

For each coverage edit failure, a telephone interview with a household member was attempted to review the information about the count of the household members and the names of the people listed on the form. When the follow-up interview was not possible, the household size was imputed by choosing the maximum count of people, not to exceed a total of five, based on all available data. A comparison between the household sizes determined through the follow-up interviews and the household sizes that would have been imputed had follow-up interviews not been completed demonstrated that the coverage edit follow-up had a substantial downward impact on the net population count for forms that failed the coverage edit. Had the coverage edit follow-up not been conducted, the mail return population would have been 0.3 percent higher in Sacramento, CA, 0.6 percent higher in South Carolina, and 0.8 percent higher in Menominee County, WI.¹²⁵

Large household follow-up.¹²⁶ The Census Bureau unsuccessfully tested a large household follow-up for the first time during the dress rehearsal. The questionnaires included spaces to record information for up to five household members. Households with six or more members were sent a follow-up questionnaire to collect the demographic data for “Person 6” and above in these large households.

Fewer than one-third of large households for all three sites returned the supplemental questionnaire. Only two-thirds of the large households received the follow-up questionnaire and less than one-half of those households returned them. In Sacramento, less than 31.1 percent of large households responded, while only 28.3 percent of large households responded in South Carolina, and 32.7 of those in Menominee. Low collection rates meant that information for additional household members had to be statistically imputed. For example, in South Carolina, 1.9 percent of the mail return population were imputed people and more than 70 percent of those people were imputed in large households.

Certain population groups that tend to predominate in large households, such as children and race/ethnic groups other than non-Hispanic Whites, had disproportionately high rates of imputed data. For instance, in South Carolina, 4.8 percent of all young children (10 and under) versus 32.2 percent of those in the large household population were imputed in large households. The results of this operation led the Census Bureau to revise the Census 2000 self-administered questionnaires to allow households to report information for up to six people, thus reducing the number of large households requiring follow-up. This follow-up was conducted by telephone rather than a supplemental questionnaire to increase completion rates.

Recruiting, hiring, and training. The Census Bureau experimented with its staffing and pay programs to ensure an adequate and stable workforce for nonresponse follow-up and other field operations during the dress rehearsal. Recruiting and training a competent, motivated, and representative staff of local enumerators who were available to work flexible hours, including evenings and weekends, and were geographically distributed across areas of a site, may have been the most important factor affecting the quality, length of time required, and overall cost of the field data collection phase of the census.

¹²⁵ As a result of the dress rehearsal, the Census Bureau designed coverage edit criteria for Census 2000 that were similar to those used in the dress rehearsal. The number of cases receiving a call was not capped as it was in the dress rehearsal and all large households were included in the follow-up operation. For Census 2000, the coverage edit follow-up and the content follow-up for large households were integrated into one operation.

¹²⁶ U.S. Census Bureau, “Census 2000 Dress Rehearsal: Evaluation Summary,” August 1999, pp. 60–61.

The agency engaged in several recruitment activities. Most applicants reported hearing of the job from a friend or through a census mailing (including recruitment postcards and the advance notices to the questionnaire). Newspaper and radio advertisements, though used minimally, proved to be only marginally effective at attracting applicants. In South Carolina, census mailings were ranked the most important method of attracting applicants, while in Sacramento “friend or relative” was the most frequent source cited for providing information about census employment. Local partnerships with community centers and other organizations also were effective in attracting applicants. In Menominee, the two most often cited sources of job information were “friend or relative” and “federal, state, or tribal employment office.” Most applicants were selected 50 to 65 days after taking the test, but this lag varied; the average time between testing and recruitment was 52 days in Sacramento, 81 days for the rural areas of South Carolina, and 61 days for the city of Colombia, SC.

Throughout Census 2000 operations, the Census Bureau made a concerted effort to hire welfare-to-work applicants, in an attempt to meet the hiring goals for federal agencies set by the President. The Secretary of Commerce set a goal of 4,000 of these individuals to be hired by the Census Bureau. At all three sites, the agency relied on its partners to help recruit applicants; the primary partners in this effort were the Department of Social Services, the Supplemental Food Program for Women, Infants, and Children, local churches, community action leagues, vocational rehabilitation centers, and the Department of Veterans Affairs. Overall, the agency exceeded its hiring goals during the dress rehearsal, though individual sites varied in their effectiveness. The Sacramento site, with a hiring goal of 49 welfare-to-work employees, hired 200 people, while the South Carolina effort employed 71 out of a hiring goal of 121, and Menominee met its hiring goal by employing 2 welfare-to-work applicants. Welfare-to-work applicants were identified via a voluntary Office of Personnel Management form (1635). Partner agencies provided additional hiring information. Some applicants chose not to identify their welfare-to-work status, so there may have been more welfare-to-work hires than reported.

There were several hiring obstacles faced when trying to hire applicants. One problem with hiring for field jobs was transportation. While this was minimized in Sacramento and South Carolina by placing welfare-to-work applicants in office positions in the local census offices, it remained a significant issue. Other applicants feared that by accepting a job their benefits would be reduced; this was particularly problematic in South Carolina. The local partners there were more interested in moving welfare recipients to longer term employment than in having people accept a short-term position. In Sacramento, the time lag between recruiting and hiring led some applicant referral sources to lose interest in promoting dress rehearsal jobs. In addition, having to report to headquarters and to referral agencies on the number of applicants tested and hired, completing earnings reports as required by the state of California, and having limited space all posed further obstacles.

Partner agencies worked with California’s Employment Services to automate hiring reports. This, combined with the Sacramento staff’s preparation of test training manuals for applicants, helped make the Sacramento site particularly successful in recruiting, testing, training, and hiring welfare-to-work applicants. The Menominee site had applicants who faced additional problems, such as lack of child care, a driver’s license, or a telephone. It also was a more competitive labor market. Since Menominee was primarily an Indian reservation and the tribe did not require residents to have a driver’s license to drive on the reservation, most applicants were unable to meet the agency’s requirement that applicants possess one. People without telephones were contacted in person by Census Bureau staff.

The agency front loaded, or hired the staff for the entire nonresponse follow-up period in the beginning, to ensure an adequate pool of ready workers for all of its field operations. Doing so allowed the agency to meet or beat established deadlines for field operations and compensate for attrition of temporary staff. The agency used data from the Pre-Appointment Management System/Automated Decennial Administration Management System to track employee payroll and hiring. The agency hoped to attract approximately ten times the number of applicants as there were enumerator positions for nonresponse follow-up. The hiring goal was approximately twice the number of authorized enumerator positions. In contrast, hiring for Integrated Coverage

Measurement/Post-Enumeration Survey (ICM/PES) was equal to the number of positions, with replacement enumerators hired as needed. Most recruits were considered eligible applicants; 70 percent in Sacramento, 83 percent in South Carolina, and 66 percent in Menominee. Relatively few who were offered positions refused—5 percent in Sacramento, 2 percent in South Carolina, and 13 percent in Menominee. The agency had some success in retaining its nonresponse follow-up hires through the training process; in Sacramento and South Carolina, 74 percent of those who began the training completed it, while 79 percent did so in Menominee. In Sacramento, 88 percent of trainees stayed on to receive an assignment, while 100 percent of those in South Carolina did so, and 86 percent of those in Menominee.

Enumerator training was evaluated both by the Census Bureau and by an outside expert. While the evaluation intended to look at trainee and trainer attitudes, trainee comprehension and skill development, and post-training performance, most of the focus was on trainer and trainee attitudes.

Enumerators received training specific to the operation to which they were assigned. The training materials were developed to be generic in nature and used in all geographic areas. There were two key distinctions. Nonresponse follow-up enumerator training provided field experience and feedback while ICM/PES did not, and the ICM/PES enumerators were provided with computer-based training while the nonresponse follow-up enumerators were not. Overall, the enumerator attitudes toward training were similar across sites and did not vary significantly between nonresponse follow-up training and ICM/PES training. All were satisfied with the skill development provided, but both nonresponse follow-up and ICM/PES enumerators still felt underprepared to deal with reluctant respondents. Nonresponse follow-up enumerators appreciated the field training, the pace of the course, and the training video. However, they expressed a need for more map training, role playing, and guidance in completing the long form and following proxy procedures. Observers noted that while enumerators claimed to be prepared to read the questions as worded, many did not do so during actual interviews. Both sets of enumerators expressed dissatisfaction with the explanation of how the supplemental pay system worked.

The Census Bureau evaluated how its new pay rates influenced its ability to recruit, hire, and retain an adequate staff of enumerators. The agency analyzed how the pay rates affected production and turnover, and examined the influence of supplemental pay. The wage rate of \$12.50 per hour in Sacramento and \$10.50 in South Carolina was adequate to hire and retain an adequate staff of enumerators. At both sites, nonresponse follow-up was completed on time and within budget. Focus groups with enumerators, recruiters, and senior managers revealed that most everyone viewed the agency's pay package favorably; the package included high hourly pay, transportation costs, and paying time in training. The agency also evaluated enumerator performance. It found that those who were previously unemployed completed fewer cases on average than enumerators who had been employed part-time or were not in the labor force (retirees); the unemployed also were quick to leave census jobs to take other work. The agency concluded that those not in the labor force could be an effective recruitment pool. It also concluded that high wages were crucial to getting these individuals to become enumerators. Further analysis suggested that a decrease in the wage rate by \$1.00 per hour would have increased the number of enumerators who quit by 25 percent. The Census Bureau concluded that paying a wage rate at least 75 percent of the prevailing wage rate is vital to recruiting part-time employees and individuals who are out of the labor force. Dress rehearsal data suggested that nonresponse follow-up for Census 2000 could be improved by selecting enumerators who were willing to work at least 24 hours per week for about 7 weeks and that all enumerators should be hired prior to the start of operations.

While it was clear that high wages were important to attract and retain enumerators, it was less clear whether the supplemental pay entitlements had any influence on performance. A post-nonresponse follow-up telephone survey of about half of all enumerators revealed that about 70 percent were very satisfied with the hourly pay, but only 32 percent were very satisfied with the supplemental pay tied to the number of cases completed each week, and less than 20 percent were very satisfied with the completion bonuses. The supplemental pay system was complex and the payments were not timely. These findings suggested that the Census Bureau should not implement a supplemental pay system for Census 2000.

The Census Bureau's Equal Employment Opportunity (EEO) office established an automated system to handle all employee and job applicant allegations of discrimination based on race, color, religion, sex, national origin, disability, age, and reprisal for participation in equal employment opportunity protected activities. Initial complaints or contacts were logged into the tracking system and EEO specialists from the agency tried to resolve the complaints and notify complainants of their rights. A limited number of initial contacts during the dress rehearsal made it difficult to evaluate the capacity of the process. A total of 14 complaints were entered between January 1 through June 30, 1998. Limited data made it impossible to predict how well the EEO process would handle the projected Census 2000 caseload.

Logistics. The Census Bureau also evaluated its ability to provide the necessary office equipment and furniture, operational forms, administrative forms, and other supplies needed by its office and field staff. The assessment, based on surveys and supply reporting systems, focused on the timeliness of opening field offices, the timeliness of receipt of supplies, and the adequacy of the quantity of supplies. Supplies that were required to open and set up offices generally arrived in a timely manner and in adequate quantity. In Sacramento, the local census office needed a supplementary order of nonresponse follow-up supplies; in some cases, the original quantities ordered were not received. In South Carolina, the initial order arrived on time and in the precise quantities originally ordered; while there was insufficient detail from Menominee to evaluate the supply ordering process. The resupply/reordering process was minimally adequate. In South Carolina, reorders were sent by facsimile to the Charlotte regional census center, which then placed an order with the General Services Administration (GSA). In some instances, the Charlotte office staff did not forward the orders to GSA and site staff had to purchase supplies locally. Limited data from the Sacramento and Menominee sites indicated that there were delays at least in the Sacramento site. For all three sites, the inventory control system was effective; inventory was checked and updated weekly.

Data Processing¹²⁷

Data processing for the dress rehearsal included: scanning to capture images; creating data files by reading the images; editing and imputation; the Within-Block Search, which searched for people to match across the block; the primary selection algorithm (PSA), which determined the data to be used for each housing unit in the census; and the Invalid Return Detection operation.

Data capture. The data capture operation for the Census 2000 Dress Rehearsal utilized digital imaging technology to capture responses from the census questionnaires. The image system consisted of scanning the questionnaires to create image files. Optical character recognition (OCR) software was used to interpret the handwritten responses, and optical mark recognition (OMR) software was used to interpret the mark responses. The system was designed with a key-from-image component to display responses on a computer screen to a keyer when the OCR software was uncertain of the correct answer. If a questionnaire could not be scanned, it was sent to be keyed from paper.

The evaluation study was only able to analyze data from the mailout/mailback short form questionnaire. Overall, the error rate for the transfer of data in check boxes (read by OMR) on the short-form questionnaire was 0.8 percent. Of these errors, 21.9 percent were from added responses that should not have been on the dress rehearsal response file, 52.8 percent were omitted responses that should have been on the response file, and 25.4 percent had the wrong response captured. Approximately 41 percent of the mark response errors may have been due to the way the respondent answered the questionnaire, while another 25 percent were from questionnaires that were received but had no data on the dress rehearsal file. In cases where a respondent marked more than one race or Hispanic-origin box, the error rate was significantly higher. When respondents marked more than one race, the data capture system missed at least one of the marks in 15.3 percent of the questionnaires. When respondents entered more than one mark on the Hispanic-origin question, the system omitted at least one mark from 23.2 percent of the questionnaires. Taken together, these multiple mark response errors represented about 29 percent of

¹²⁷ U.S. Census Bureau, "Census 2000 Dress Rehearsal: Evaluation Summary," August 1999, pp. 72–78.

the mark omission errors. The high rate of errors in this case was due, in part, to a lack of time. The Office of Management and Budget's (OMB) revised Statistical Policy Directive No. 15, which was released on October 30, 1997, required federal agencies to capture multiple responses to the race question. This requirement was added too late for the Census Bureau to develop and test the data capture system's ability to capture multiple responses prior to the dress rehearsal.

While the Census Bureau was unable to assess the dress rehearsal OCR quality, the overall system yielded a 3.0 percent error rate for write-in fields that were filled (this included OCR and keying in fields that were unreadable by the OCR software). However, the error rate varied by field. For instance, the coverage question (number of household residents) had an error rate of 1.0 percent, while the three race question write-in areas had error rates between 9.8 percent and 12.3 percent across sites. Respondents to the race question sometimes used irregular truncation and abbreviations of their entries to be sure that they fit into the space provided (20 segmented boxes). Of the write-in response errors, 63.7 percent had wrong characters or numbers, 13.8 were omitted responses that should have been on the dress rehearsal response file, 10.9 percent had characters or numbers omitted, 5.5 percent had characters or numbers added, 1.7 percent were added responses that should not have been on the response file, and 4.5 percent were characters in numeric fields, or vice versa. Most of the errors in the OCR system, 40.4 percent, probably were due to illegible handwriting; others arose when respondents edited their answers or did not use a pen to complete the questionnaire. Approximately 24 percent of write-in errors may have been due to the way that a respondent filled out the questionnaire (for instance, crossing out a response and writing in another). Approximately 29 percent of the errors had no apparent cause and 6.6 percent of write-in response errors were from questionnaires that were checked into the data capture system but had no data on the dress rehearsal response file. The agency worked closely with the contractor to address these issues in preparation for Census 2000.

The agency evaluated the effect of segmented write-in areas (boxes) on the quality of data gathered from the three race write-in response areas. It also evaluated the quality of the coding operation for both the general and expert race coding. General coding was handled by an automated system, while expert coding, done manually by expert staff members, was applied to write-in entries that could not be processed through the automated system. More than 80 percent of write-in responses were coded by the automated system, which was far less than the 97 percent that were coded automatically during the 1990 Census. The lower rate was a result of changes in the race question (in particular, the option to select more than one race), changes in coding procedures, and the use of segmented boxes. All long write-ins, those of more than 20 characters, required an expert coder. The major race groups (White, Black, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander) and the Some Other Race category were represented in the distribution of long write-ins. Nearly 60 percent of long write-ins required the use of more than one race code. In addition, 0.3 percent of respondents wrote in "American" and 4.6 percent of responses were uncodable. The agency predicted that most of the questionnaires that would require expert coding for Census 2000 would be those cases of long write-ins that require multiple codes; all 461 of the long write-ins for the dress rehearsal required expert race coding.

The Census Bureau also tested two methods to resolve instances of multiple responses from the same household and from those individuals who used one of the new response options such as replacement questionnaires, Be Counted forms, and Telephone Questionnaire Assistance (TQA) interviews. In the update/leave areas of South Carolina about 6 percent of households had more than one return, while in all other areas the rate was about 12.5 percent; at all sites fewer than one-half of 1 percent of addresses returned more than two responses. In addition to households submitting multiple mail responses, between 3 and 4 percent of all housing units were counted both by a mail response and by nonresponse follow-up. In some cases, addresses enumerated by Be Counted responses and TQA interviews were not geocoded or matched prior to the identification of the nonresponse follow-up workload. Hence, these addresses which had submitted a response, were still placed in the nonresponse follow-up universe. In some instances, specific nonresponse follow-up cases were assigned to more than one enumerator, generating more than one response for the same address. Households with more than one eligible questionnaire were subject to unduplication procedures within the block and at the address.

Within-Block Search Operation and Primary Selection Algorithm¹²⁸

The plan for Census 2000 included making it easier for people to respond by providing multiple response options. This included allowing people to respond on Be Counted forms, the Internet, and the telephone. In the Census 2000 Dress Rehearsal, a blanket replacement questionnaire, used to improve mail response rates, was another option. Overlaps between late receipts of mail returns and the identification of nonresponding cases that require a personal visit during nonresponse follow-up also resulted in multiple responses. These and other situations can cause the receipt of more than one census return for an address. A special computer program was designed and implemented in the Census 2000 Dress Rehearsal to control the introduction of errors by resolving situations where more than one form was received from an address. The program consisted of two major steps: the Within-Block Search (WBS) and the primary selection algorithm (PSA).

Within-block search operation. The WBS was implemented for the first time in Census 2000 Dress Rehearsal. It was a person-based search operation that occurred prior to the PSA and was designed to screen out certain records on respondent-initiated returns (i.e., forms received as a result of “Be Counted,” Telephone Questionnaire Assistance, etc.). Those records found to match people who were enumerated on another census return were flagged during this operation and were not eligible for selection during the PSA processing.

The WBS had a noticeable effect in update/leave areas of Columbia, SC, and in a minimal to non-existent effect elsewhere. About 9 percent of the persons in the WBS workload for update/leave areas of Columbia were matched to people in the expanded search area. Rates in the other sites were 1 percent or less.

Primary selection algorithm. The PSA was used to determine the person records and housing data that represented each census identification. The PSA processing was performed on all eligible records after the WBS had been run.

Most of the multiple returns in the dress rehearsal occurred when:

- Respondents completed both an initial and a replacement questionnaire.
- A household was enumerated during nonresponse follow-up and also on a late mail return.
- A household was enumerated twice during nonresponse follow-up.
- A household completed either a Be Counted form or a Telephone Questionnaire Assistance interview and also was enumerated during nonresponse follow-up.

With the exception of update/leave areas in Columbia, SC, all sites recognized more than one return for about 12.5 percent of the census identifications. The rate of census identifications with more than one return in Columbia’s update/leave areas was about 6 percent. At all sites, fewer than one-half of 1 percent of the identifications had more than two returns.

A review of the identifications with two returns identified which response options generated the returns. A blanket replacement mailing in mailout/mailback areas intentionally created multiple contacts. This was the major reason for multiple returns in Sacramento, CA, and in mailout/mailback areas of Columbia, SC. Other options inadvertently overlapped with nonresponse follow-up operations (including receipt of late returns, Be Counted forms, etc.). Furthermore, responses on Be Counted forms and from Telephone Questionnaire Assistance required address geocoding and matching to obtain a census identification, which was not completed prior to the start of nonresponse follow-up operations. As a result, many of these households were enumerated again during nonresponse follow-up. Finally, there was evidence that nonresponse follow-up cases were assigned to more than one enumerator, resulting in multiple nonresponse follow-up returns being generated for the same census identification.

¹²⁸ Miriam D. Rosenthal, U.S. Census Bureau, “The Within-Block Search and Primary Selection Algorithm Operational Evaluation,” Census 2000 Dress Rehearsal Evaluation Memorandum, F1c-F2b, April 1999.

Invalid return detection operation. During the invalid return detection operation, a contractor submitted invalid cases to help the Census Bureau assess whether the fraudulent forms could be detected and removed. The operation also looked at the characteristics of the contractor-submitted fraudulent forms that were not removed from the dress rehearsal.

There were two situations that caused fraudulent forms to be removed: the form did not meet census inclusion criteria during a processing step, or the form was detected during invalid return detection operation. The contractor-submitted forms went through normal census processing until the application of WBS and PSA. At that point, the submitted invalid returns were removed from the dress rehearsal processing flow and a parallel evaluation file was created and processed.

Of the 772 contractor-submitted fraudulent cases captured during the dress rehearsal, 401 cases were in South Carolina. Of these forms, 259 (65 percent) were removed from the dress rehearsal enumeration. The remaining forms were included in the evaluation file. In Sacramento, CA, of the 371 invalid returns submitted, a total of 251 (67 percent) were removed from the dress rehearsal evaluation file.

Following the dress rehearsal, the Census Bureau studied the characteristics of the contractor-submitted cases that were not detected so as to design a process to ensure that fraudulent forms were screened out during Census 2000.

Sampling

While Public Law 105-119 required the Census Bureau to prepare for a census that did not include the use of statistical sampling, the possibility remained that the Supreme Court would allow the planned use of sampling to produce the population figures for apportionment. The agency prepared two operations to determine the accuracy of the initial phase of the dress rehearsal. The first, Integrated Coverage Measurement (ICM), measured the undercount and used statistical methods to adjust the results from two dress rehearsal sites (Sacramento and Menominee). The second, Post-Enumeration Survey (PES), measured the accuracy of the population figures derived through traditional methods at the third site (South Carolina).

The ICM/PES processes began with the agency creating an independent list of housing units in the sample of ICM/PES blocks. To ensure its independence, the list was created by a staff that was separate from the one that developed the dress rehearsal master address file. Next, the agency matched the housing unit list to the MAF and resolved the status of nonmatches during a field check. At the end of nonresponse follow-up (NRFU), the agency staff interviewed every housing unit on the independent list and matched those interviewed with the people enumerated in the census in the same sampled block or surrounding block. All mismatches were resolved during a follow-up interview. The agency then imputed any missing information. Once these operations were complete, the Census Bureau created post-strata for each dress rehearsal location based on such variables as age, sex, race, and tenure. The agency used the data to calculate the coverage factor in each post-stratum using dual system estimation. After applying the coverage factors to the appropriate post-stratum of census people, the agency created population estimates for each. The results were integrated into the final dress rehearsal numbers in Sacramento and Menominee and provided coverage estimates for the results from South Carolina.

Though the results were used differently, the ICM and PES used similar procedures and both were designed to measure net coverage error in the census.¹²⁹ Both included an independent enumeration in a sample of census blocks, matched the results with the returns from the census, and created estimates of those missed (people not counted), counted more than once (duplicates), and erroneously enumerated (those who were counted, but should not have been) or who were counted in the wrong location. The results of both were used to create coverage factors for a variety of sub-populations. The main difference was that the PES estimates served as a measure of dress rehearsal coverage for South Carolina, while the ICM results were incorporated into the final population figures for Sacramento and Menominee.

¹²⁹ The comparable coverage measurement survey used for Census 2000 was the Accuracy and Coverage Evaluation (A.C.E.). See Chapter 10, "Testing, Experimentation, Evaluation, and Coverage Measurement Programs" for more on the A.C.E.

The Census Bureau created a Master Activity Schedule (MAS) for the dress rehearsal ICM/PES to determine whether planned tasks were completed on time. While the overall ICM/PES schedule was met and several individual tasks were completed on time, the majority of tasks were completed late. Every group of major tasks took longer than planned and several took twice as long as planned. The agency reviewed field observation reports and other contractor reports concerning field management, telecommunications, and computer-assisted personal Interviewing (CAPI) components of the ICM/PES personal interview operations. These reports raised a number of field and systems concerns. The former included the need for strong managers for the Census 2000 Coverage Measurement Survey (later named the Accuracy and Coverage Evaluation) who had sufficient experience with CAPI operations, the need for more space for crew leaders to meet with ICM interviewers, and space away from the local census office that could act as a staging location for equipment and as a distribution hub.¹³⁰ The systems concerns included hiring sufficient staff, particularly for key functions (e.g. CAPI instrument testing and sampling and estimation programs). Other staffing concerns related to the need for sufficient help desk support for field interviewers, field technicians for regional offices, and computer engineers and software specialists. The agency also recommended conducting full systems tests.

Because ICM/PES interviews took place after Census Day, the Census Bureau attempted to account for people who completed a census questionnaire at one address and then moved before they could be enumerated through the ICM/PES process. In Sacramento and South Carolina, 5 percent of all households were considered to be outmovers, those who had moved out of enumerated households. In Menominee, the number of outmovers was too small to produce enough data for analysis. The agency tested two methods to collect data on outmovers: either via proxy data that were collected from neighbors or the new residents (inmovers) or by tracing outmovers to their new residences and collecting data from them. Tracing the outmovers to their new residences proved to be difficult, time consuming, and expensive. As a result, the agency evaluated whether it could rely on proxy data. It tested the quality of estimates based on proxy data versus traced outmover data and found that there were no significant differences in the dual system estimates calculated using either method. Dual system estimation was the method used by the ICM/PES to calculate the coverage factors used to measure and possibly correct for net coverage errors. As a result of this evaluation, the agency recommended dropping outmover tracing from the Census 2000 Accuracy and Coverage Evaluation.

The dress rehearsal used dual system estimation to produce final population numbers for Sacramento and Menominee, and coverage estimates for South Carolina. This method required the agency to produce two independent lists of the population. These independent lists were used to test differences between ICM/PES blocks and non-ICM/PES blocks. The agency's model assumed that there would be no "contamination," which happened when an individual's inclusion or exclusion from one list affected the probability of their inclusion on the other list. The agency tested whether this was a valid assumption and found no evidence of contamination in the dress rehearsal. In order to protect against contamination in Census 2000, the agency planned to minimize the overlap between census field operations and the Accuracy and Coverage Evaluation survey.

The Census Bureau evaluated the extent of ICM/PES interview falsification during the dress rehearsal by conducting field reinterviews. Before initiating quality assurance reinterviews, the agency conducted the initial ICM/PES interviews; there were 17,060 interviews in Sacramento, 18,302 in South Carolina, and 801 in Menominee. The agency used two methods to conduct these quality assurance reinterviews: for the first, a 5 percent systematic sample was drawn to identify participants, and for the second, the agency selected targeted households based on specific selected criteria. In Sacramento, there were 1,696 quality assurance reinterviews, 821 of which were randomly selected and 875 were targeted. In South Carolina, there were 1,634 reinterviews: 853 were randomly selected and 781 were targeted. In Menominee there were 113 reinterviews: 32 were selected randomly and 81 were targeted. At all 3 sites, targeting identified a nominally higher percentage of potentially falsified cases than did systematic sampling.

¹³⁰ Since ICM/PES had to follow strict rules of independence from the census, its location could not be part of the census infrastructure.

The agency also analyzed survey processing and measurement errors through three studies: the Matching Error Study, the Evaluation Follow-up Interview, and the Data Collection Mode Study. The Matching Error Study examined the clerical matching process of the ICM/PES to determine accuracy rates. Computers performed the initial match of ICM/PES returns to census records; those cases that the computer could not resolve were sent to clerical matchers and expert matchers. For this operation, expert matchers rematched people within each block of a subsample of the ICM/PES blocks that were chosen for the evaluation. The discrepancy rates between the ICM/PES and Matching Error Study operations were less than one percent in each of the three dress rehearsal sites; this error rate was lower than expected. Because expert matching proved to be so reliable, the agency decided that once a trained matcher's work met certain criteria, a 10 percent sample of the work would be reviewed in Census 2000, rather than 100 percent.

The Evaluation Follow-up Interview measured two types of survey error. The first type, which was introduced to the survey process by the interviewer, respondent, or instrument, identified measurement error by redoing the person follow-up interviews in a subset of the evaluation sample blocks. Matchers used both sets of person follow-up interviews to determine the final residence status and match status for each person. The results of this study provided a measure of the error in the production data. The second type of error measured was production error that resulted from the decision to omit certain people from the person follow-up interview, even though they did not match between the initial enumeration and the ICM/PES. The Evaluation Follow-up Interview was designed to determine whether omitting these people would have a significant effect on the final data. For Sacramento and South Carolina, the agency found no significant differences in the dual system estimates at the site level or for any of the post strata. Estimates for Menominee were not calculated.

Due to operational problems during the dress rehearsal, the sample for the Data Collection Mode Study was too small to draw any conclusions.

The Census Bureau, in preparation for the possibility that it would be barred from conducting a census that utilized statistical sampling, tested the efficacy of using administrative records to supplement the enumeration. Administrative records were program specific files that were maintained by various federal, state, and local agencies and contained individual-level identifying information. The agency targeted four specific federal files: the Department of Housing and Urban Development's 1997 Tenant Rental Assistance Certification System, the Internal Revenue Service's Tax Year 1996 Individual Master Return File, the Department of Health and Human Service's Public Health Services 1997 Indian Health Service Patient Registration File, and the Selective Service System's 1997 Registration File. The Census Bureau also tried to acquire various site specific administrative records, such as school enrollment, driver's license, and voter registration files. Acquiring administrative records proved to be labor intensive and time consuming and offered no guarantee of success. The agency chose not to use administrative records during Census 2000 and recommended that in cases where the agency wanted to use them, it should identify those state and local files that promise the greatest return.

As part of its evaluation program, the Census Bureau examined the consistency of housing and population totals for the dress rehearsal with independent benchmarks,¹³¹ such as persons per household, age/sex distributions, race/Hispanic-origin distributions, vacancy rates, and group quarters population. The agency compared these independent benchmarks to census data. It also used independent population estimates to make inferences about the magnitude of the population undercoverage. This independent study helped the agency to evaluate the consistency of the dress rehearsal PES estimates and the effectiveness of the ICM in achieving a reduction in the overall and differential net undercounts. In general, the demographic distributions (e.g. age, race, sex, Hispanic origin) and rates (e.g. vacancy rates, persons per household) were in line with previous census results and expected trends since 1990.

¹³¹ J.G. Robinson, A Adlakha, and K.K. West, U.S. Census Bureau, "Assessment of Consistency of Census Results with Demographic Benchmarks," Census 2000 Dress Rehearsal Evaluation Memorandum C7, 1999.

In Sacramento, the final population numbers for the dress rehearsal were produced by applying a statistical correction based on ICM to the results of the initial enumeration. The ICM was a series of data collection and processing operations designed to provide a measurement of the undercount and to produce an accurate, adjusted one-number census. These operations included about 16,400 households. The agency attempted to contact each household by telephone and personal visits to households that were not reachable by telephone. When the telephone and personal visits were unsuccessful, the agency tried a final personal visit a few weeks later, known as nonresponse conversion. Telephone interviewing began May 11, 1998, and ended on May 27, 1998. Personal interviewing (including nonresponse conversion) was scheduled to end on September 4, 1998, but actually was completed one day earlier. The response rate was at least 95 percent but is not directly comparable to 1990 Census PES response rates, as each used different methodologies. The final population figure for Sacramento, released on January 14, 1999, was 404,313 people. This figure was consistent with the State of California's estimate. The net ICM correction of the initial enumeration was 6.3 percent, which also was validated by comparison to independent benchmarks, which predicted population undercoverage between 3 and 7 percent for the enumeration without ICM correction. The independent figures were generated using the 3.0 percent PES net undercount estimate in 1990 and estimated population change for 1990–1998 (births, deaths, and migration). The dress rehearsal housing unit total of 158,281, however, was below the Census Bureau demographic and State of California agency estimates (by 0.5 and 1.9 percent, respectively).

In Menominee, as in Sacramento, the Census Bureau used a correction based on ICM for the initial enumeration to produce population numbers. ICM operations were conducted for about 800 households. The telephone interview phase began on May 11, 1998, and ended on May 26, 1998. The personal visit interview (including nonresponse conversion) ended on September 3, 1998. The response rate was 98.5 percent, but again, this figure is not comparable to 1990 Census PES response rates, as the two sets of numbers were derived using different methodologies. The final population figure for Menominee, released on January 14, 1999, was 4,738. This initial enumeration corrected by ICM results was consistent with the independent demographic benchmarks, not adjusted for undercoverage, and fell between the estimate provided by the State of Wisconsin and the Census Bureau's demographic estimates. The ICM estimate showed a net undercount of 3.0 percent, which also was validated by comparison to independent demographic estimates adjusted for net undercount. However, the agency could not make any reliable statements given the imprecision in the independent estimate for such a small site; the alternative adjusted estimates predicted a population undercoverage between 3 and 11 percent. The independent figures were generated by using a 10.0 percent net undercount estimate in 1990 and estimated change for 1990–1998. The dress rehearsal housing unit total of 2,046, however, was higher than expected.

In South Carolina, the Census Bureau used a Post-Enumeration Survey (PES) to measure net undercounts or overcounts. The PES operations were the same as those conducted for the ICM, but the results of the PES were only used to measure the accuracy of the traditional enumeration results. This operation covered about 18,000 households. The telephone interview phase began on May 11, 1998, and ended on June 9, 1998. The personal visit interview (including nonresponse conversion) was completed on August 27, 1998, 16 working days ahead of the original deadline of September 21, 1998. The response rate was at least 95 percent. The final population for the South Carolina site was 662,140, which was below expected levels predicted by demographic estimates. The population figure was about 4.5 percent below the independent benchmark of the 1990 census numbers adjusted for change but not undercoverage. The PES revealed that the net undercoverage for the site was 9.0 percent, a figure that was broadly consistent with the Census Bureau's demographic estimates, which had predicted a population undercoverage of about 7.0 percent. The housing unit total of 273,497 also was short of the estimated level.

Overall, the Census 2000 Dress Rehearsal was successful. The agency produced population figures on schedule, and those numbers, including ICM/PES data, compared favorably with independent benchmarks. The dress rehearsal confirmed that statistical methods such as ICM and PES produced population figures that were closer to the independent estimates of the population than were those numbers produced by counting alone. While the agency hoped to use ICM to adjust

Census 2000, its ability to do so depended on the outcome of two court cases that reached the U.S. Supreme Court. While waiting for a decision, the agency was following two operating plans, one that included the planned use of statistical sampling and one that did not.

THE SUPREME COURT'S SAMPLING DECISION

On January 25, 1999, the U.S. Supreme Court ruled that a 1976 amendment to the Census Act barred the use of statistical sampling techniques to produce the state population counts from Census 2000 used to apportion seats in the U.S. House of Representatives. However, the Court also acknowledged that the 1976 amendment allowed the use of statistical sampling for non-apportionment purposes, if it were feasible to do so. In accordance with the Court's decision, the Census Bureau also planned to conduct an Accuracy and Coverage Evaluation (coverage measurement) survey to evaluate the results of the traditional enumeration and to assess the feasibility of potentially adjusting the figures for non-apportionment purposes. For more on the controversy over the use of sampling, including a discussion of court cases, see Chapter 11, "Legal Issues." For more on the specific aspects of the enhanced traditional enumeration used during Census 2000 (e.g. the marketing program, questionnaire development, address list development, etc.), see the relevant chapters.

Chapter 3.**Population and Housing Questions**

INTRODUCTION	99
Questionnaires	99
Respondent Assistance	99
Remote Alaska	100
Data Collection	100
Data Capture and Processing	101
General automated coding	102
Editing and allocation	102
Housing Units	102
Group Quarters	102
Institutionalized population	103
Noninstitutionalized population	103
Comparability	103
Transient Night (T-Night)	104
Service-Based Enumeration (SBE)	104
Limitations of the data	105
SIMILARITIES AND DIFFERENCES BETWEEN THE 2000 AND 1990 CENSUS QUESTIONNAIRES	106
Justification for the Questions Asked in Census 2000	106
New Questions on the Long Form for 2000	106
Essentially Unchanged Questions	106
Revised Questions	107
1990 Census Questions Omitted in 2000	107
INTERCENSAL RESEARCH	107
LONG-FORM SAMPLING	107
LONG-FORM ESTIMATION	109
Requirements	109
Background and Research	109
Weighting Areas	110
Ratio Estimation Groups and Weighting Procedure	110
Weighting Approval Process	114
Long-Form Estimation	114
LONG-FORM SAMPLING VARIABILITY	114
Methodology	115
Presenting Sampling Errors	115
PRESENTATION OF INDIVIDUAL QUESTIONS	116
Household Roster Questions	116
Question 1. Number of Residents	116
Question 2. Names of Residents	117
100 Percent Population Questions	117
Question 1. Name	117
Question 2. Household Relationship	118
Derived variables	119
Question 3. Sex	121
Question 4. Age and Date of Birth	121
Question 5. Spanish/Hispanic/Latino Origin	122
Question 6. Race	123
Sample Population Questions	125
Question 7. Marital Status	125
Questions 8 and 9: Education	125
Questions 8a and 8b. School Enrollment and Attendance	126
Question 9. Educational Attainment	126
Question 10. Ancestry or Ethnic Origin	127
Question 11. Language	128
Question 12. Place of Birth	129
Question 13. Citizenship Status	131

CONTENTS

Question 14. Year of Entry	131
Question 15. Residence 5 Years Ago.	132
Questions 16 and 17: Disability	133
Question 16. Sensory and Physical Disability	134
Question 17. Mental, Self-Care, Go-Outside-Home, and Employment Disability	134
Question 18. Age Screen	135
Question 19. Grandparents as Caregivers	136
Question 20. Veteran Status, Period of Active-Duty Military Service, and Years of Active-Duty Military Service	137
Questions 21 Through 32: Employment, Commuting, Income	138
Question 21. Employment Last Week	138
Question 22. Place of Work	139
Question 23. Means of Transportation to Work and Private Vehicle Occupancy (Carpooling)	140
Question 24. Time of Departure From Home and Travel Time to Work	141
Question 25. Layoff/Work Absence/Recall/Job Search/Availability Last Week	142
Question 26. Year Last Worked	144
Question 27. Industry or Employer	145
Question 28. Occupation.	146
Question 29. Class of Worker	147
Coding	147
Classification systems for coding	148
Editing and allocation	149
Comparability	149
Question 30. Work Experience.	150
Questions 31 and 32: Income and Total Income	151
Poverty Status in 1999.	153
Derivation of the current poverty measure	153
How the Census Bureau determined poverty status	153
Individuals for whom poverty status was determined	154
Comparability	154
100 Percent Housing Question.	155
Vacancy Status	155
Question 33. Tenure	155
Sample Housing Questions.	156
Question 34. Units in Structure	156
Question 35. Year Built	156
Question 36. Year Householder Moved In	157
Question 37. Number of Rooms	157
Question 38. Number of Bedrooms	158
Question 39. Complete Plumbing Facilities	158
Question 40. Complete Kitchen Facilities	158
Question 41. Telephone Service in Housing Unit	159
Question 42. Fuel Used Most for House Heating	159
Question 43. Vehicles Available	160
Question 44. Value Screener and Farm Residence.	161
Question 45. Costs of Utilities and Fuels	162
Question 46. Monthly Rent, Meals Included in Rent.	163
Question 47. Mortgage Status, Monthly Payment, Taxes and Insurance Included in Monthly Mortgage Payment	164
Question 48. Second Mortgage, Home Equity Loan	165
Question 49. Real Estate Taxes	165
Question 50. Fire, Hazard, and Flood Insurance.	165
Question 51. Value of Property	166
Question 52. Monthly Condominium Fee	166
Question 53. Mobile Home Costs	167

Chapter 3: Population and Housing Questions

INTRODUCTION

This chapter describes each population and housing question in the basic form used for Census 2000 in terms of the question's purpose and history, instructions for completion, relevant instructions for coding, and summary of the computer editing and allocation specifications.

Questionnaires

The two primary Census 2000 questionnaires were (1) the "short" form (D-1), which contained only the "100 percent" items, that is, those questions asked about every person and about each housing unit and (2) the "long" form (D-2), which included both the 100 percent questions and additional questions asked of the occupants of a sample of the housing units. The U.S. Census Bureau mailed about 83 million short forms, with 7 questions, and 15 million long forms, with 53 questions that included the 7 questions on the short form. In most areas 5 out of 6 households received the short form, while 1 out of 6 received the long form. The short form was the shortest decennial census questionnaire in 180 years, containing six population questions and one housing question. The long form, containing 32 population questions and 21 housing questions, was the shortest such form since the Census Bureau began long-form sampling in the 1940 census. In addition to the two basic questionnaires, special forms were used to enumerate people in group quarters.¹ These included the Individual Census Report (D-20A and D-20B), Military Census Report (D-21), Shipboard Census Report (D-23), and Individual Census Questionnaire (D-15A and D-15B), known as the ICR, MCR, SCR, and ICQ respectively.²

Respondent Assistance

Census 2000 made several services available to respondents in order to increase participation and accuracy. From March 8 to April 14, 2000, the Census Bureau maintained 23,556 Questionnaire Assistance Centers (QACs), staffed by Census Bureau employees and volunteers.³ These QACs were located in community centers, large apartment buildings, health centers, and other sites appropriate to the particular community served. About 559,000 respondents visited QACs during their approximately 5 weeks of operations.

From March 31 to April 17, 2000, the Census Bureau also maintained 51,692 "Be Counted" sites in places such as private businesses, churches, community centers, tribal offices, libraries, post offices, and QACs. In the Be Counted operation, people who believed they had not been counted in the census could pick up and complete unaddressed census questionnaires. The 804,939 Be Counted forms returned to the Census Bureau added 239,128 people living in 116,019 households to the census who had not been included on other forms.⁴

The Census Bureau also provided assistance to non-English-speaking respondents. Individuals could request versions of the long- and short-form questionnaires in Spanish, Tagalog, Vietnamese, Chinese, or Korean and language assistance guides in 49 languages plus Braille and large

¹ See the "Group Quarters" section in this chapter for a definition and description of group quarters.

² See Appendix D and Appendix E at the end of this volume for facsimiles of the short and long Census 2000 questionnaires. For a discussion of the separate questionnaires developed for the Island Areas, see Chapter 12, "Puerto Rico and the Island Areas," in Volume 2 of this *History: 2000 Census of Population and Housing*. Facsimiles of those questionnaires are in the appendixes of Volume 2. The content of these questionnaires differed somewhat from those used in the states and Puerto Rico.

³ See Fred R. Borsa and Christine L. Hough, *Data Collection in Census 2000*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 13, TR-13 (Washington, DC: U.S. Census Bureau, 2004), esp. pp. 30–32.

⁴ See Jon R. Clark and Darlene A. Moul, *Coverage Improvement in Census 2000 Enumeration*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 10, TR-10 (Washington, DC: U.S. Census Bureau, 2004), p. 9.

print. By April 5, 2000, the Census Bureau had received about 2.5 million such requests, of which nearly 2 million were for the Spanish form.⁵ Enumerators also used foreign-language guides, available in 49 different languages, when the enumerator or the respondent was more comfortable using a language other than English. Additionally, between March 3 and June 30, the Census Bureau provided its Telephone Questionnaire Assistance (TQA) program with seven toll-free telephone numbers offering assistance in six languages (English, Spanish, Tagalog, Vietnamese, Chinese, and Korean) and by telecommunications device for the deaf (TDD). By the end of June, the TQA program's 22 call centers had received over 6 million calls (86.9 percent English, 12.6 percent Spanish, and 0.4 percent Asian languages) and had taken about 120,000 census enumerations over the phone.⁶

The Internet Questionnaire Assistance and Internet Data Collection services began on March 3, 2000, offering information about the census as well as an opportunity for respondents to complete the short form online. The Internet Data Collection service received almost 70,000 census responses, nearly 66,000 of which were from unique addresses before it closed on April 19. The number of such responses was small because virtually none of the Census 2000 advertising alerted respondents to the Internet as a vehicle for answering the census. After much discussion, the Census Bureau decided not to advertise the Internet response option because it had not been tested during the dress rehearsal and because of the possible adverse public reaction to a perceived threat to census confidentiality posed by hackers during the transmission of completed census forms. Internet Questionnaire Assistance continued until early in July.⁷

Remote Alaska

Enumeration of remote areas of Alaska presented special challenges, in part because those areas often were accessible only by small plane, snowmobile, four-wheel-drive vehicle, dogsled, or some combination of these. The spring thaw made travel even more difficult and increased the likelihood that potential respondents would be away from their residences fishing or hunting. Therefore, this enumeration began on January 20, 2000, in Unalakleet and proceeded northward in three successive waves, ending on April 22.

Data Collection

The Census Bureau used four basic types of enumeration to get responses to the census: mailout/mailback, list/enumerate, update/enumerate, and update/leave. The **mailout/mailback** method was used to enumerate households located in cities, towns, suburban areas, selected rural areas, and small towns where mailing addresses consisted mainly of house numbers and street names that permitted letter carriers to deliver questionnaires to specific housing units. Respondents completed and mailed back their questionnaires. This method applied to the majority of households enumerated.

The **list/enumerate** method (formerly the "conventional" or door-to-door method), was used in remote, sparsely populated areas of the country with hard-to-determine mailing addresses. Enumerators compiled a list of addresses or locations, delivered and collected questionnaires in one visit, then revised the census map as needed. Census workers visited nearly half a million such housing units.

The **update/enumerate** and **update/leave** methods were used mostly in rural or remote areas where existing mailing addresses were unreliable and likely to need updating. Such areas included some selected American Indian reservations; resort areas with high concentrations of seasonal vacant housing units; and small, rural, unincorporated Spanish-speaking communities known as "colonias" located largely along the Mexican border with Texas and Arizona.⁸ In update/enumerate areas, census workers visited households, updated address lists, and completed a

⁵ James B. Treat, *Response Rates and Behavior Analysis*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 11, TR-11 (Washington, DC: U.S. Census Bureau, 2004), pp. 14–15.

⁶ John Chesnut, "Telephone Questionnaire Assistance," Census 2000 Evaluation No. A.1.a., March 20, 2003.

⁷ Erin Whitworth, "Internet Data Collection," Census 2000 Evaluation No. A.2.b., August 14, 2002.

⁸ The California/Mexico border also contained a small number of colonias.

questionnaire for each occupied or vacant housing unit. In update/leave, the Census Bureau compiled lists of housing units in advance of the census. Enumerators then visited each household, updated their address lists, and left a census questionnaire to be completed by the resident and returned by mail in an addressed envelope. At the same time, enumerators added new addresses to their address lists and marked new housing unit locations on the census maps. The update/leave method was used for all households in Puerto Rico, as well as in targeted urban areas in the United States where mail delivery could be a problem, as in apartment buildings where letter carriers might leave census questionnaires in a common space. The Census Bureau delivered about 22.5 million questionnaires in update/leave areas.

In late February and early March of 2000, the U.S. Postal Service (USPS) delivered advance letters to over 98 million of the nation's residential addresses, notifying recipients that they would soon receive the Census 2000 questionnaire or would be contacted by a census enumerator. Census Bureau staff delivered nearly 23 million additional advance letters to housing units in update/leave areas. Then from March 13 through March 15, in the mailout/mailback areas of the country, the USPS delivered questionnaires to about 98 million addresses and asked respondents to mail back the completed questionnaire by April 1 in the enclosed, preaddressed envelope. The update/leave process started on March 3. Census enumerators personally delivered about 22.5 million questionnaire packages to occupied and vacant housing units that did not have city-style addresses. The list/enumerate process began on March 13.

Along with the short- or long-form questionnaire, respondents received a brochure titled “Your Guide for the 2000 U.S. Census Form” (Form D-3 for the short questionnaire and Form D-4 for the long questionnaire). Beginning March 20, 2000, the Census Bureau mailed about 120 million reminder cards to encourage respondents to complete and mail back the form and to thank those who had done so.

In mail census areas (these included mailout/mailback areas where the USPS delivered questionnaires and update/leave areas where census enumerators left questionnaires), enumerators followed up on nonresponding households (those not returning questionnaires) and vacant units. In list/enumerate areas, enumerators visited every housing unit to conduct an interview at each household and to administer a long-form questionnaire at a sample of housing units. Enumerators had specific instructions (in the D-561, *Census 2000 Questionnaire Reference Book*, and the *Enumerator's Manual*, forms D-546, D-547, and D-548) on how to conduct an interview, ask each question, and fill in respondents' answers to certain questions. These instructions were designed to maximize self-enumeration and minimize the amount of error introduced into data collection by the enumerator. For example, respondents were asked to provide answers to age and race items rather than enumerators' inferring the answers from observation. Enumerators also received classroom training on the key aspects and requirements of the job.

Data Capture and Processing

The Census Bureau adopted a new data capture technology for Census 2000 and employed a contractor, Lockheed Martin Corp., to develop, deploy, and maintain the new system in four data capture centers (DCCs) located across the country. The Data Capture System 2000 (DCS 2000) used high-speed electronic (digital) imaging, optical mark recognition (OMR), and optical character recognition (OCR) technologies, and replaced the FOSDIC-based (film optical sensing device for input to computers) microfilm-scanning technology used in the previous four decennial censuses. DCS 2000 scanned the completed questionnaires, then produced electronic images of the pages, optically read handwritten marks and write-in entries from the imaged questionnaires, and converted these data into files that were sent to Census Bureau headquarters for tabulation and analysis. When the OMR/OCR process could not interpret the data within specified confidence limits, the form image was automatically sent to the key-from-image operation, which required operators to key the data into the system manually.

At the peak period for data capture (late March 2000), as many as 17 tractor trailers arrived at each DCC, each trailer carrying up to 324,000 short-form questionnaires or 43,200 long-form questionnaires. Nationwide, on a typical peak day DCS 2000 processed about 22 million short forms or 2.9 million long forms. (See Chapter 6, “Data Capture and Processing,” for a detailed description of data capture and pretabulation processing.)

General automated coding. As was done in the 1990 census, an automated coding system for written responses to the race, Hispanic origin, ancestry, relationship, language, industry and occupation, place of work, place of birth, and migration items was used for Census 2000. The automated system aimed to reduce the potential for error associated with clerical coding. Using master files containing millions of unique coded written responses from previous censuses and surveys, the system automatically coded the written responses if the entry matched an entry already in the master files. Specialists with a thorough knowledge of subject-matter categories and classification systems reviewed and coded responses that were not automatically coded.

The major difference between the 1990 and the Census 2000 automated system was that the Census 2000 system assigned up to two 3-digit codes for a multiple race response or for a written response on the “American Indian or Alaska Native” write-in line, the “Other Asian” or “Other Pacific Islander” write-in line, or the “Some Other Race” write-in line for the race item.

Editing and allocation. Editing addressed inconsistent responses and used other information on the questionnaire to help fill blank or inconsistently reported items. Missing values were assigned from the related responses provided by other household members (“within-household” imputation) or, if necessary, from responses provided by individuals in other housing units who had similar characteristics (“hot-deck”⁹ imputation). Imputations based on within-household or hot-deck procedures were called “allocations.”

In some cases “substitution” (or “whole-household substitution”) was used when there were no “data-defined” (see definition below) people in the household. In substitution, the population characteristics of a nearby household of the same size were assigned, using a substitution hot deck, into the household lacking these characteristics. “Data-defined” person records were those with two or more responses to the 100 percent population items. A respondent’s name counted as a response. Any person record that did not meet this criterion was considered non-data defined. If no person record for the household was data defined, substitution was applied. Otherwise, the editing and allocation procedures described above were used to provide the information needed, either one item at a time or jointly for two or more items.

Housing Units

The Census Bureau recognizes two types of living quarters: housing units and group quarters. Living quarters are structures intended for residential use (for example, a one-family home, apartment house, nursing home, dormitory, or mobile home). Housing units are defined as houses, apartments, mobile homes or trailers, groups of rooms, or single rooms occupied as separate living quarters or, if vacant, intended for occupancy as separate living quarters. To qualify as living in a separate housing unit, the occupants must live separately from any other individuals in the building and have direct access from outside the building or through a common hall.

Group Quarters

All people not living in housing units are classified by the Census Bureau as living in group quarters.¹⁰ As in previous censuses, the Census Bureau conducted a separate operation to enumerate people living in group quarters in Census 2000. The group quarters enumeration was conducted from April 1 to May 6, 2000.¹¹ Locations classified as group quarters included such places as college dormitories, correctional institutions, nursing homes, group homes, mental hospitals or wards, hospitals or wards for the chronically ill, hospices, and military quarters. Special procedures and questionnaires were used to enumerate people in group quarters. The questionnaires

⁹ A “hot deck” was a data table (or matrix) in which values of reported responses, stratified by selected characteristics of the respondents, were stored and updated on a flow basis and used as needed to assign values of the variable in question to people with similar characteristics who did not have a response.

¹⁰ People without conventional housing who were enumerated at service facilities (e.g., shelters for abused women, soup kitchens, and regularly scheduled mobile food vans) or at targeted nonsheltered outdoor locations were classified as part of the group quarters population even though many of them had no visible living quarters.

¹¹ Florence H. Abramson, *Special Place/Group Quarters Enumeration*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 5, TR-5 (Washington, DC: U.S. Census Bureau, 2004), p. 4.

(Individual Census Reports, Individual Census Questionnaires, Military Census Reports, and Ship-board Census Reports) included the 100 percent population questions but excluded housing questions. All people in group quarters were asked the basic population questions; in most group quarters, additional questions were asked of a sample of people (1 in 6). In 2000, 7.8 million people were tabulated in group quarters, representing 2.8 percent of the total population. This was an increase of 16 percent, or almost 1.2 million people, since 1990.

Two general categories of people were recognized in group quarters: (1) the institutionalized population and (2) the noninstitutionalized population.

Institutionalized population. This included people under formally authorized, supervised care or custody in institutions at the time of enumeration. Such people were classified as patients or inmates of an institution regardless of the availability of nursing or medical care, the length of stay, or the number of people in the institution. Generally, the institutionalized population was restricted to the institutional buildings and grounds (or must have had passes or escorts to leave) and thus had limited interaction with the surrounding community. Also, they were generally under the care of trained staff who were responsible for their safekeeping and supervision.

Institutions included schools, hospitals, or wards for the physically or mentally handicapped; hospitals or wards for mental or chronic disease patients; patients in wards of general and military hospitals who had no usual home elsewhere; hospital wards for drug/alcohol abuse; rooms for long-term care patients in wards or buildings on the grounds of hospitals, nursing homes, convalescent homes, and rest homes for the aged and dependent; juvenile institutions, including homes, schools, orphanages, or residential-care facilities for neglected, abused, and dependent children; and correctional institutions, including halfway houses operated for correctional purposes. Staff residents, that is, staff personnel who lived at the facility, were classified with the noninstitutionalized group quarters population.

Noninstitutionalized population. This included people who lived in group quarters other than institutions, such as staff residing in military and nonmilitary group quarters on institutional grounds who provided formally authorized, supervised care or custody for the institutionalized population. This population also included college student dormitories and fraternity and sorority houses on and off campus; military quarters, including barracks or dormitories on base, transient quarters on base for temporary residents (both civilian and military), and military ships; agricultural and other workers dormitories; dormitories for nurses and interns in general and military hospitals; Job Corps and vocational training facilities; religious group quarters such as convents, monasteries, or rectories; community-based group homes, including those which provided supportive services for the aged, mentally ill, mentally retarded, physically handicapped, and drug/alcohol abusers; communes; maternity homes (for unwed mothers); other nonhousehold living situations, such as youth hostels, YMCAs, and YWCAs; and service-based enumeration locations, including emergency and transitional shelters (public and private) for people experiencing homelessness; shelters for children who were runaways, neglected, or without conventional housing; and hotels and motels used to provide shelter for people without conventional housing. Although soup kitchens, regularly scheduled mobile food vans, and targeted nonsheltered outdoor locations were not living quarters, people enumerated at these locations were considered part of the noninstitutionalized group quarters population.

Comparability. The Census Bureau has collected and published data on certain types of institutions since 1850. However, several changes have occurred in how some group quarters were classified and tabulated. For Census 2000, the definition of the institutionalized population was consistent with the definition used in the 1990 census. As in 1990, the definition of “care” only included people under organized medical or formally authorized supervised care or custody.

In Census 2000, the 1990 and 1980 rule of classifying ten or more unrelated people living together in a housing unit as living in noninstitutional group quarters was dropped. (In 1970, the

criterion was six or more unrelated people.) Some examples of changes in the tabulation of specific types of group quarters included the following:

- Police lockups were included with local jails and other confinement facilities in 2000 and grouped separately in 1990.
- Homes for unwed mothers were included in “other group homes” in 2000 and grouped separately in 1990.
- Military hospitals or wards for the chronically ill, other hospitals or wards for the chronically ill, hospices or homes for the chronically ill, wards in both military and general hospitals with patients who had no usual home elsewhere, and Job Corps and vocational training facilities were tabulated separately in 2000.
- Rooming and boarding houses were classified as housing units in 2000 rather than as group quarters as in 1990.

Transient Night (T-Night). The Census Bureau conducted its Transient Night (T-Night) enumeration on the evening of March 31, 2000, aiming at locations where residents were highly transient, such as campgrounds at racetracks and parks, recreational vehicle campgrounds, commercial and public campgrounds, fairs, carnivals, and marinas. This enumeration stretched out over a couple of weeks in some large recreational vehicle parks, but was essentially complete by May 5. Enumerators conducted personal interviews using simplified enumerator questionnaires. People enumerated during T-Night were tabulated in housing units rather than in group quarters, as was done in 1990.

Service-Based Enumeration (SBE). In preparation for the SBE, the Census Bureau contacted national organizations and governmental agencies to acquire lists of facilities such as shelters and soup kitchens that primarily served people without any usual residence.¹² In the spring of 1999, the Census Bureau conducted a follow-up mailing to about 39,000 governmental units and national advocacy groups requesting a list of all service-based facilities in their areas. At that time, the Census Bureau also asked governmental units to indicate whether they had or would have targeted nonsheltered outdoor locations such as bridges, boarded-up buildings, alleys, or streets where people without any usual residence were known to live or sleep. Sites were required to have specific location descriptions. Commercial sites such as all-night movie theaters or all-night diners were excluded.

Based on responses received, the Census Bureau conducted a targeted mailing to those governmental units who reported such locations in order to elicit specific information about the sites, to establish contacts, and to plan for the enumeration process. Census Bureau personnel then visited the sites several weeks before the enumeration to formulate plans for conducting enumerations at particular facilities and locations. During the advance visit, the Census Bureau collected relevant information such as the number of people expected to be housed at each shelter, the number of meals served, which meals served the most people at each soup kitchen, and how many people received services at each regularly scheduled mobile food van site. The Census Bureau made a special effort to recruit and train enumerators for the SBE who had experience working with people who did not live in conventional housing.

The SBE operation consisted of four separate enumerations conducted from March 27 through March 29, 2000. These were the shelter enumeration, the soup kitchen enumeration, the regularly scheduled mobile food van enumeration, and the targeted nonsheltered outdoor locations enumeration. Enumerators attempted to gain complete responses from all people interviewed. If faced with refusals, they tried to obtain information from knowledgeable workers or contact people at the site. SBE data-captured records were considered data-defined if they contained two or more of the following data characteristics: name, sex, age and/or date of birth, Hispanic origin, and race. Forms were available in Spanish and English. There was a total of 14,817 SBE sites visited.

¹² Tracey McNally, “Service-Based Enumeration Final Report,” Census 2000 Evaluation No. E.6., November 6, 2002.

The shelter enumeration involved 7,571 sites and took place on March 27, 2000, from 6 p.m. to midnight in order to maximize the completeness of the count. Two-member enumeration teams enumerated people at most shelters using Individual Census Reports (ICRs). At some shelters, enumeration teams containing more than two enumerators were used because of the size of the shelter. All clients were asked the basic 100 percent population items, and additional questions were asked of a sample (1 in 6) of the clients at emergency and transitional shelters (with sleeping facilities) for people experiencing homelessness; shelters for children who were runaways, neglected, or without conventional housing; shelters for abused women (or shelters against domestic violence); and hotels and motels used to provide shelter for people without conventional housing. The soup kitchen enumeration and the regularly scheduled mobile food van enumeration involved 2,223 sites. These two operations were planned separately and had distinct training materials. However, both were conducted on the same day, often by the same enumerators who divided their time between the soup kitchens and the regularly scheduled mobile food vans. The soup kitchen enumeration was conducted on March 28 during the meal at which the greatest number of clients at that particular site were served. If more than one seating was used to serve clients at the chosen meal, enumerators waited for the next group and continued until people at all seatings had been enumerated. The regularly scheduled mobile food van enumeration took place on March 28 at various times of the day as vans made rounds. At both soup kitchens and regularly scheduled mobile food vans, enumerators conducted personal interviews with clients using the Individual Census Questionnaire (ICQ). This questionnaire included the 100 percent basic population questions that were asked of all clients. Additional questions were asked of a sample (1 in 6) of the population at soup kitchens only.

The Census Bureau conducted its targeted nonsheltered outdoor locations enumeration, involving 5,023 sites, on March 29, 2000, from 4 to 7 a.m. Enumerators interviewed each respondent using a D-20A short form ICR only. Enumerators did not wake sleeping people, but tried to interview as many people as possible before daybreak, when people dispersed. If a person was not awake or refused to respond, the enumerator completed as much information as possible by asking the contact person or someone else who might know the individual.

People enumerated at shelters or at targeted nonsheltered outdoor locations were counted in the census geography where the shelter or nonsheltered outdoor site was located. People enumerated at soup kitchens or regularly scheduled mobile food van locations were counted at the census geography where those service facilities were located at the time of enumeration, unless a person provided a usual home elsewhere (UHE) address. If a UHE address was provided, the UHE address was used.

Limitations of the data. People who were well hidden, moving about, or in locations other than those identified by the local governments as targeted nonsheltered outdoor locations could not be enumerated. The Census Bureau's objective was to count everyone. The agency neither wanted nor intended to provide an official count of the homeless population. Also, the SBE operation did not represent a count of the population that used services in 2000 at any geographic level, for a number of reasons including:

- The dynamic conditions of homelessness meant that a one-time count produced different results than measurement over time would have.
- Federal and local jurisdictions used differing definitions of homelessness.
- Some types of service locations, such as drop-in centers and street outreach teams, were not included as service locations in the SBE operation.
- Those lacking conventional housing living at outside locations other than the targeted nonsheltered outdoor locations identified for the census were not included in this operation.

SIMILARITIES AND DIFFERENCES BETWEEN THE 2000 AND 1990 CENSUS QUESTIONNAIRES

Justification for the Questions Asked in Census 2000

All of the questions included in the Census 2000 questionnaires were subjected to a rigorous review to ascertain whether they were necessary. Between December 1992 and the summer of 1994, the U.S. Office of Management and Budget and the Census Bureau worked together to identify federal agencies' data needs for Census 2000, according to the degree to which these subjects were required by law and the lowest geographic level needed. Also, the needs of state, local, and tribal governments were considered as part of obtaining nonfederal requirements for the content of Census 2000.¹³

The Census Bureau used the same three-category typology to classify the data needs expressed by both federal agencies and nonfederal data users: mandatory, required, and programmatic. Mandatory needs covered instances in which federal law explicitly called for decennial census data. Required needs were those in which federal law required the data and the decennial census was the only source or the historical source, or in which there were case law requirements imposed by the federal court system. Programmatic needs were considered data items that were used for federal program planning, implementation, or evaluation or for providing legal evidence (but the underlying laws of which did not explicitly require the use of data).¹⁴

Only those questions with a strong legislative or judicial justification were included in Census 2000, meaning only those subjects where the assessment identified needs as either mandatory or required. Programmatic needs were insufficient by themselves to justify inclusion. All items on the 100 percent questionnaire (short form) were classified as mandatory: name,¹⁵ relationship to Person 1, sex, age, Hispanic origin, race, and tenure (home owner or renter). On the sample questionnaire (long form), the Census Bureau classified another 18 of the sample questions as mandatory (for a total of 24) and 28 as required. Individual questions or parts of questions could provide data for more than one category of use and for more than one federal agency or department.

New Questions on the Long Form for 2000

These included the following: Question 8b (current grade level) and Question 19 (grandparents as caregivers).

Essentially Unchanged Questions

Questions, also referred to as "items," that were the same or much the same in 2000 as in 1990 were 3 (sex); 8a (school enrollment); 9 (educational attainment); 10 (ancestry or ethnic origin); 11a, b, c (language); 13 (citizenship); 15a, b (residence 5 years ago); 20c (years of active-duty military service); 22a, b, c, d, e, f (place of work); 23a, b (means of transportation to work); 24a, b (time of departure from home and travel time to work); 25d (work absence last week); 27a, b, c (industry or employer); 28a, b (occupation); 29 (class of worker); 30b, c (weeks and hours usually worked); 31a, d, g (income); 32 (total income); 43 (vehicles available); 44a (value screener); 44c (farm residence); 47a, b, c, d (mortgage status, monthly payment, taxes and insurance included in monthly mortgage payment); 48b (second mortgage and home equity loan, amount); 49 (real estate taxes); 50 (fire, hazard, and flood insurance payments); and 52 (condominium fee).

¹³ For a description of federal, state, and local data needs and the uses to which these data are put, see Constance F. Citro, Daniel L. Cork, and Janet L. Norwood (eds.), *The 2000 Census: Counting Under Adversity*, Chapter 2, "Census Goals and Uses," (Washington, DC: National Academies Press, 2004).

¹⁴ U.S. Census Bureau, "Preparing for Census 2000: Questions Planned for Census 2000," March 1998, pp. 1-1-1-3 and "Talking Points for the Congressional Briefing on the Long Form," loose-leaf binder memorandum, March 28, 2000. In conjunction with the adoption of the American Community Survey as the replacement for long-form data collection in the 2010 census, the Census Bureau adopted a different policy on content determination. See "U.S. Census Bureau Policy on New Content for the American Community Survey," memorandum, March 31, 2006.

¹⁵ Strictly speaking, "name" was not considered a data item by the Census Bureau; it is included in this list because it was asked of all respondents.

Revised Questions

The following items on the 2000 long-form questionnaire included wording changes that differed from their counterparts in 1990: 1 (name and person); 2 (relationship); 4 (age and date of birth); 5 (Spanish/Hispanic/Latino origin); 6 (race); 7 (marital status); 12 (place of birth); 14 (year of entry); 16a, b (disability); 17a, b, c, d (mobility limitations, self-care limitations, and work limitations); 18 (age screen); 20a (veteran status); 20b (period of active-duty military service); 21 (employment last week); 25a, b, c, e (work absence last week); 26 (year last worked); 30a (work experience); 31b, c, e, f (income); 33 (tenure); 34 (units in structure); 35 (year built); 36 (year householder moved in); 37 (number of rooms); 38 (number of bedrooms); 39 (complete plumbing facilities); 40 (complete kitchen facilities); 41 (telephone service in housing unit); 42 (fuel used most for house heating); 44b (value screener/farm residence); 45a, b, c, d (costs of utilities and fuels); 46a, b (monthly rent, meals included in rent); 48a (second mortgage, home equity loan); 51 (value of property); and 53a, b (mobile home costs).

Items 33, 36, 37, 38, 39, 40, 42, 45, and 46a in the 2000 questionnaire differed from their counterparts in 1990 solely or principally in the addition of “mobile home” to the “house or apartment” terminology used in the wording of these questions; mobile homes were considered to be housing units in both censuses.

1990 Census Questions Omitted in 2000

The following items from the 1990 census were omitted in 2000: 20 (children ever born); 21b (number of hours worked last week); H15 (source of water); H16 (sewage disposal); and H18 (condominium status).

INTERCENSAL RESEARCH

Between censuses, the Census Bureau consults with a wide range of data users; tests various approaches to questionnaire design, question wording and order, data collection and capture, and tabulation and publication of data products and media for distributing them; and evaluates the efficacy and cost-effectiveness of new methods and technologies. The results of this research informs all aspects of census taking. For example, in an effort to halt or reverse the decline in mail response rates that the census suffered between 1970 and 1990 (from 78 to 65 percent), the Census Bureau investigated ways to increase the user friendliness of the questionnaire. One goal was to increase the attractiveness of the questionnaire, but this conflicted with the need to improve coverage. Initially, the Census Bureau planned to use a questionnaire in 2000 that asked for information on up to five people instead of the seven-person form used in 1990. A compromise resulted in the adoption of a six-person version.¹⁶ Because of the more stringent criteria used for placing questions on the 100 percent questionnaire (short form) in Census 2000, the number of questions was reduced from 13 in 1990 to 6 in 2000. On the other hand, the number of items on the sample form (long form) remained about the same in 2000 as in 1990. Research carried out in 1992 and 1993 suggested that response rates would improve markedly with repeated contact with respondents. The Census Bureau decided to adopt a multiple-contact approach (including an advance letter sent before the questionnaire and a reminder postcard sent later) as well as a redesigned, more attractive census form. However, direct mail firms informed the agency that a targeted mailing of a second questionnaire to nonresponding households would not be possible in the short time available.¹⁷ For a more detailed description of the intercensal research that preceded Census 2000, see Chapter 2, “Planning the Census.”

LONG-FORM SAMPLING

The sample, or “long,” form asked the 100 percent questions plus additional questions (e.g., income, marital status, housing unit value or rent) from a sample of people and housing units. The primary sampling unit was the housing unit, including all occupants. There were four different housing unit sampling rates: 1 in 8, 1 in 6, 1 in 4, and 1 in 2 (designed for an overall average

¹⁶ U.S. Census Bureau, “New Six Person Mailback Questionnaires,” Census 2000 Decision Memorandum No. 62, October 30, 1998.

¹⁷ See the research summarized in Constance F. Citro, Daniel L. Cork, and Janet L. Norwood (eds.), *The 2000 Census: Counting Under Adversity* (Washington, DC: National Academies Press, 2004) pp. 80–82.

of about 1 in 6). For people living in group quarters or enumerated at long-form-eligible service sites (shelters and soup kitchens), the sampling unit was the person, with only one rate, 1 in 6. Census 2000 used these variable sampling rates in order to plan levels of sampling error for small areas and to decrease respondent burden in the more densely populated areas, while maintaining the reliability of the data.

The Census Bureau assigned each block a sampling rate based on precensus estimates of occupied housing units in various geographic and statistical entities, such as incorporated places and census tracts. (For a discussion of census geography, see Chapter 7, “Census Geography and the Geographic Support System.”) Therefore, the observed sampling rate for any geographic area varied according to the mix of the sampling rates of the area’s blocks and the success in collecting the sample data for all assigned housing units. When all sampling rates and implementation were taken into account across the country, Census 2000 sampled about 15 percent of the population and 16 percent of the housing units. Tables of the observed sampling rates for population and housing units, by various levels of geography, can be found at <http://censtats.census.gov/SamplingRate.shtml>.

The sample designation method for housing units depended on the data collection procedure (see Chapter 5, “Data Collection,” for details). Approximately 115.9 million housing units were enumerated by mail procedures in the United States and Puerto Rico (92.5 million by mailout/mailback and 23.4 million by update/leave). Housing units included on the decennial master address file (DMAF) were electronically designated as sample units based on each block’s assigned sampling rate. The questionnaires were either mailed or hand-delivered to the addresses with instructions to complete and mail back the form.

About 1 million housing units were in update/enumerate areas. Housing units included on the DMAF were electronically designated as sample units based on each block’s assigned sampling rate. Housing units that were added in the field were sampled at a rate equal to the highest sampling rate assigned to a block within the enumerator’s assignment area.

Long-form sampling entities (LFSEs) were defined for sampling purposes as counties and county equivalents, cities, and incorporated places; minor civil divisions in Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin; American Indian reservations, tribal jurisdiction statistical areas (later replaced for Census 2000 by entities called Oklahoma tribal statistical areas), and Alaska Native Village statistical areas; census designated places in Hawaii; and school districts. Except as described below for list/enumerate areas, blocks in an LFSE with an estimated occupied housing unit count less than 800 were sampled at 1 in 2, while blocks in an LFSE with an estimated occupied-housing-unit count of at least 800 but less than 1,200 were sampled at 1 in 4. Blocks in census tracts with an estimated occupied housing unit count of less than 2,000 were sampled at 1 in 6 for those portions not already assigned a sampling rate of 1 in 2 or 1 in 4. Blocks within tracts with an estimated 2,000 or more occupied housing units were sampled at 1 in 8 for those portions not already assigned a higher sampling rate.

In list/enumerate areas (about 0.4 million housing units), the enumerators had blank address registers with designated sample lines. Beginning about Census Day, they systematically canvassed their assigned areas and listed all housing units in the address register. They collected 100 percent data for all units, plus sample information for any housing unit listed on a designated sample line. In list/enumerate areas, the housing unit sampling rate was 1 in 2 when fewer than 1,200 occupied housing units (as measured in the 1990 census) were estimated to be in any LFSE containing a block within the enumerator’s assignment area, and 1 in 6 elsewhere. All Remote Alaska assignment areas were sampled at 1 in 2. A sample tolerance check detected and corrected enumerator biases in distributing the long form according to the predesignated sampling pattern.

Housing units in American Indian reservations, tribal jurisdiction statistical areas, and Alaska Native village statistical areas were sampled according to the same criteria as other LFSEs, except that the occupied-housing-unit estimates used in the sample selection process were modified to

reflect the size of the American Indian and Alaska Native population as measured in the 1990 census. Trust lands were sampled at the same rate as their associated reservations.¹⁸

LONG-FORM ESTIMATION

Requirements

As in previous decennial censuses, all estimation procedures used for Census 2000 required the assignment of sampling weights to individual records for each sample person and housing unit. These records were then stored on data files that had undergone computer edits for accuracy and consistency. For all census tabulation areas, the characteristic totals were estimated by simply summing the weights assigned to the appropriate sample person records or housing unit records. The weighting procedures were required to meet the following criteria:

- Only a single weight was to be assigned to each individual sample person record or housing unit record. In principle, each response item could be individually weighted to reflect edited and imputed items. However, the practicalities of assigning, storing, controlling, and using different item weights, especially for composite variables, combined to make the use of item weighting infeasible.
- The assigned weights were to be integers. This was necessary for data users' convenience since it eliminated problems of differences due to rounding between data tables with similar marginal categories.
- Sample estimates from the long form were to equal short-form census counts, or controls, for items that were on both forms. This agreement was required for total population and housing unit counts for counties and larger geographic areas and for some smaller areas as well. Agreement between the sample estimates and control figures for other characteristics such as age, race, sex, and Hispanic origin were also to be achieved, except where sample sizes were too small. This constraint was imposed to reduce sampling variance and for the convenience of the data users.
- The estimation procedure was to be designed to dampen the effect of any bias that occurred in sample selection.

In general, the estimation procedure dealt with groups of records within specially defined areas called "weighting areas." Within each weighting area, control counts and sample counts were obtained for various characteristics. For these characteristics, the sample was weighted to agree with the control counts, using an iterative procedure to assign weights to the sample records within each weighting area. Weighting areas and procedures are described on the next page.

Background and Research

After the 1960 census, agency staff examined the properties of a number of different ratio-estimation procedures and used the iterative proportional fitting methodology, also known as "raking." Experience with the 1960 estimator suggested that the procedure ought to incorporate household size in the definition of the ratio-estimate groups. However, the number of these groups defined by expanding each of the 44 age, sex, and race groups by six household size categories could not be used efficiently by an estimator of the 1960 type, and other estimators therefore had to be considered.

The Census Bureau chose the estimator for the 1970 census using the following criteria. The estimator was to:

- Dampen the effect of any biases that occurred in sample selection.
- Reduce the variance of sample estimates.
- Improve the consistency between complete counts and sample estimates.

¹⁸ U.S. Census Bureau, "Requirements for Measures of Size to Assign Long Form Sampling Rates," Census 2000 Informational Memorandum No. 24, September 17, 1999.

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- Be economical to execute.
 - Permit reasonably accurate estimates of sampling error to be computed.

Prior to the 1980 census, the agency decided to conduct an empirical and theoretical study using 1970 census data to compare alternative estimation procedures.¹⁹ These included a simple inflation estimator, a poststratified ratio estimator, and the raking ratio estimator. In addition, the estimates for various characteristics of available sample and complete-count (i.e., 100 percent) totals were compared for the poststratified and raking ratio estimators. Considering the same criteria for choosing an estimator as noted above, the results of the research indicated the raking ratio estimator was preferable, particularly for controlling the effect of biases resulting from the systematic undercoverage of some demographic groups. The staff also investigated this estimator's convergence properties. Because the 1990 census sample was selected using three sampling rates, the Census Bureau decided to incorporate sampling rate as the fourth dimension in the ratio-estimation procedures.

In 1990, the staff completed an empirical study designed to compare several methods for producing sample tabulations of family characteristics. Based on results from the study, it was concluded that none of the methods under consideration was significantly better than the method used in 1980 to produce family estimates. In 2000, as in the previous two censuses, family estimates were tabulated by adding the weight of Person 1 in family households.

For Census 2000, the reduction in the items on the short form forced the elimination of some categories in the raking procedure for occupied housing units.

Weighting Areas

Prior to the raking ratio-estimation procedure, each state was divided into weighting areas. Initial weighting areas were formed by combining records with the same area sampling rate within tabulation block groups. Final weighting areas required a minimum sample of 400 people and were formed by combining initial weighting areas. In counties with a sample count of less than 400 people, the minimum sample size requirement was relaxed so the entire county could be a weighting area.

Ratio Estimation Groups and Weighting Procedure

Within a weighting area, the ratio-estimation procedure for people was performed in four stages. The first stage applied 21 household-type groups. The second stage used three groups: sampling rate of 1 in 2; sampling rate of 1 in 4; and sampling rates less than 1 in 4. The third stage used the householder/nonhouseholder dichotomy.²⁰ The fourth stage applied 312 aggregate age-sex-race-Hispanic-origin groups. The stages were as follows:

PERSONS

Stage I—Type of Household

People in housing units with a family with own children under 18:

- | | |
|---|----------------------------------|
| 1 | 2 people in housing unit |
| 2 | 3 people in housing unit |
| 3 | 4 people in housing unit |
| 4 | 5 people in housing unit |
| 5 | 6–7 people in housing unit |
| 6 | 8 or more people in housing unit |

¹⁹ Jay Kim, John H. Thompson, Henry F. Woltman, and Stephen M. Vajs, "Empirical Results from the 1980 Census Sample Estimation Study," paper presented at the Joint Statistical Meeting, 1981, Chicago, IL; printed in *Proceedings of the Section on Survey Research Methods of the American Statistical Association* (Alexandria, VA: American Statistical Association, 1981), pp. 170–75.

²⁰ The person or individuals occupying a housing unit were termed a "household," and the reference person (Person 1) was the "householder."

People in housing units with a family without own children under 18:

7–12 2 through 8 or more people in housing unit

People in all other housing units:

13 1 person in housing unit

14–19 2 through 8 or more people in housing unit

Group quarters:

20 people in group quarters

Service-based enumerations:

21 people enumerated at service sites

Stage II—Sampling Type

1 1 in 2

2 1 in 4

3 1 in 6 or 1 in 8

Stage III—Householder Status

1 Householder

2 Nonhouseholder

Stage IV—Race/Hispanic Origin/Age/Sex

People of Hispanic origin:

Black:

Male:

1 0–4 years

2 5–14 years

3 15–17 years

4 18–19 years

5 20–24 years

6 25–29 years

7 30–34 years

8 35–44 years

9 45–49 years

10 50–54 years

11 55–64 years

12 65–74 years

13 75+ years

Female:

14–26 Same age categories as Groups 1 through 13

American Indian or Alaska Native:

27–52 Same gender and age categories as Groups 1 through 26

Asian:

53–78 Same gender and age categories as Groups 1 through 26

Native Hawaiian or Pacific Islander:

79–104 Same gender and age categories as Groups 1 through 26

White:

105–130 Same gender and age categories as Groups 1 through 26

Other:

131–156 Same gender and age categories as Groups 1 through 26

People not of Hispanic origin:

157–312 Same race, gender, and age categories as Groups 1 through 156

Respondents who indicated that they belonged to two or more races (multirace respondents) were included in one of the six major race groups for estimation purposes only. Subsequent tabulations were based on the full set of responses to the race item.

Within a weighting area, the first step in the estimation procedure was to assign an initial weight to each sample person record. This weight was approximately equal to the inverse of the observed sampling rate for the initial weighting area. These weights were added into a four-dimensional matrix, called the “raking matrix,” and added to the marginal totals for the four dimensions. Census counts were obtained as control counts corresponding to these marginals.

The next step in the estimation procedure, prior to iterative proportional fitting, was to combine categories in each of the four estimation stages, when needed, to increase the reliability of the ratio-estimation procedure. For each stage, if a group did not meet certain criteria for the unweighted sample count or for the ratio of the control count to the initially weighted sample count, it was combined, or collapsed, with another group in the same stage according to a specified collapsing pattern. The fourth stage applied an additional criterion concerning the number of sample people in each race/origin category.

As the next step, the initial weights underwent four stages of ratio adjustment, with the grouping procedures described above applied. At the first stage, the ratio of the control count to the sum of the initial weights for each sample person was computed for each Stage I group. The initial weight assigned to each person in a group was then multiplied by the Stage I group ratio to produce an adjusted weight. In Stage II, the Stage I adjusted weights were again adjusted by the ratio of the control count to the sum of the Stage I weights for sample people in each Stage II group. Next, at Stage III, the Stage II weights were adjusted by the ratio of the control count to the sum of the Stage II weights for sample people in each Stage III group. Finally, at Stage IV, the Stage III weights were adjusted by the ratio of the control count to the sum of the Stage III weights for sample people in each Stage IV group. The four stages of ratio adjustment were repeated in the order given above until predefined stopping criteria were met.

The weights obtained from the final iteration for Stage IV were then assigned to the sample person records. However, to avoid complications in rounding for tabulated data, only whole number weights were assigned. For example, if the final weight of the people in a particular group was 7.25, then one-quarter of the sample people in this group were randomly assigned a weight of 8, while the remaining three-quarters received a weight of 7. If any weights were excessive, the collapsing criteria were tightened to achieve additional collapsing and lower final weights.

The ratio-estimation procedure for housing units was essentially the same as that for people, except that vacant units were treated separately. The occupied-housing-unit ratio-estimation procedure was done in three stages, while the one for vacant units was done in a single stage. The first stage for occupied housing units applied 19 household-type groups, while the second stage

applied 3 sampling-type groups. The third stage used 24 tenure/race/Hispanic-origin groups. The stages for ratio estimation for housing units were as follows:

OCCUPIED HOUSING UNITS

Stage I—Type of Household

People in housing units with a family with own children under 18:

- 1 2 people in housing unit
- 2 3 people in housing unit
- 3 4 people in housing unit
- 4 5 people in housing unit
- 5 6–7 people in housing unit
- 6 8 or more people in housing unit

People in housing units with a family without own children under 18:

- 7–12 2 through 8 or more people in housing unit

People in all other housing units:

- 13 1 person in housing unit
- 14–19 2 through 8 or more people in housing unit

Stage II—Sampling Type

- 1 1 in 2
- 2 1 in 4
- 3 1 in 6 or 1 in 8

Stage III—Race and Hispanic Origin of Householder/Tenure

Owner:

Householder of Hispanic origin:

- 1 Black or African American
- 2 American Indian or Alaska Native
- 3 Asian
- 4 Native Hawaiian or Pacific Islander
- 5 White
- 6 Other

Householder not of Hispanic origin:

- 7–12 Same race categories as Groups 1 through 6

Renter:

- 13–24 Same race and Hispanic origin categories as Groups 1 through 12

A simple ratio adjustment in one dimension was used for vacant housing units.

VACANT HOUSING UNITS

- 1 Vacant for rent
- 2 Vacant for sale
- 3 Other vacant

The estimates produced by this procedure realized some of the gains in sampling efficiency that would have resulted if the population had been stratified into the ratio-estimation groups before sampling and if the sampling rate had been applied independently to each group. The net effect was a reduction in both the standard error and the possible bias of most estimated characteristics to levels below what would have resulted from simply using the initial, unadjusted weight. This estimation procedure was designed so that the estimates from the sample would be more consistent with the control counts for the population and housing unit groups used in the estimation procedure than simply using the initial, unadjusted weights.

Weighting Approval Process

In Census 2000, the weighting operation was reviewed by state as the states were processed. The entire weighting procedure was independently programmed, and results were compared to the production results. A fully detailed review was completed for three test states, Vermont, West Virginia, and New Jersey. There were a summary review and detailed analysis of selected weighting areas for the remaining states. Final weights were verified for all persons for all states. In addition, Census Bureau headquarters staff received output from the weighting operation that gave both detailed and summary information concerning the weighting operation for each weighting area in a state. The output included certain demographic counts, marginal weighting matrix counts, details of the weighting area formation and weighting matrix collapsing, and other analytical data relating to the weighting operations.

Long-Form Estimation

Once the final weights were developed, long-form estimation was relatively simple: to estimate the number of people with certain characteristics in a given geographic area, add the weights of people with the characteristics. To estimate means, such as per capita income, for some group, divide the total weighted income of people in the group by the weighted number of people in the group.

LONG-FORM SAMPLING VARIABILITY

Due to sampling variability, statistics based on a sample of the population differ from figures that would have been obtained if a complete census had been taken using the same questionnaires, instructions, and enumerators. Sample results were also subject to the same response, reporting, and processing errors which would be present in data from a complete census.

To ensure that sample statistics from the census would be properly interpreted, a statement on their reliability appeared in census publications. The estimates of reliability reflected sampling error and some effects of the estimation procedure but did not reflect the effect of response or processing variance or any effect of bias arising in data collection, processing, or estimation.

A major concern in the choice of a method of presenting sampling errors arose from the number of statistics produced. To compute and show the sampling error for each published characteristic in each tabulation area would have been costly and time-consuming, and it also would have doubled space needed to present the results in published volumes. Also, the estimates of sampling errors for individual small estimates are highly variable and, therefore, not very reliable. The Census Bureau decided, therefore, to group the individual census items into homogeneous classes. The publications show the average of the sampling errors for the items in each class. Users are instructed how to estimate this average, or typical sampling error, for any characteristic.

Almost all of the statistics tabulated from the census sample could be characterized as 0-1 variates; that is, the person or housing unit was assigned the value “1” if that person or housing unit possessed the characteristic, and “0” otherwise. The design of the census sample and the ratio-estimation procedure used suggested that the variances would usually have a fairly simple relationship to those arising from a simple random sample of the same size. This led to a decision to present the sampling errors in the form of “design factors”—the ratio of the estimate of the standard error of the census sample to the standard error for a 1 in 6 simple random sample.²¹

Methodology

The first step in the process of providing estimates of sampling error, as represented by the variance or the standard error (the square root of the variance), was to estimate the sampling errors for a large number of characteristics. Because a complex estimator and a systematic sample of clusters (households) were used, no simple mathematical formula could be derived that would directly estimate the variance from the census sample. The variance of census estimates was therefore approximated by a procedure known as successive difference replication.²² This procedure involved generating 52 replicate samples for each weighting area. The order of selection in the sample was reflected in the replicates. All sample units in the weighting area were included in each replicate, although with differing weights. A ratio adjustment was made to the replicate weights in order to adjust the total population estimate for each replicate to the full sample total. The variance was estimated from the resulting replicate samples using a standard variance formula for successive difference replication.

Approximately 300 direct variance estimates were calculated for states, counties, places, and census tracts for the demographic profiles. In addition, the agency produced approximately 4,000 direct variance estimates for each weighting area. These were used to calculate generalized variance design factors for all possible estimates by dividing the estimated standard error by the standard error which would be expected from a simple random sample of the same size. Extremely high estimates of design factors were removed. The average of the remaining data item design factors by sampling rate category was calculated across weighting areas within the state. The average design factor (weighted by the weighted count of the data item) was then computed over data items by 60 subjects, such as place of work or poverty, and by four observed sampling rates (less than 15 percent, 15 to 25 percent, 25 to 35 percent, and over 35 percent). The national- and state-level design effects are available at <<http://www.census.gov/prod/cen2000/doc/sf3.pdf>>.

Presenting Sampling Errors

The design factors at the national or state level can be used to estimate the long-form standard error of any estimate. Data users are instructed to find the design factor for the subject area of interest (e.g., language usage or number of rooms) based on the observed sampling rate and to estimate the standard error which would be obtained if the sample were a simple random sample by a simple formula using only the estimate and the size of the area. They then multiply the design factor by the simple random sample standard error to obtain an estimate of the standard error of the census statistic of interest.

²¹ Stephen P. Hefter and Philip M. Gbur, “Overview of the U.S. Census 2000 Long Form Weighting,” paper presented at the Joint Statistical Meeting, 2002, New York; printed in *Proceedings of the Section on Survey Research Methods of the American Statistical Association* (Alexandria, VA: American Statistical Association, 2003), pp. 1418–23.

²² Robert E. Fay and George F. Train, “Aspects of Survey and Model-Based Postcensal Estimation of Income and Poverty Characteristics for States and Counties,” paper presented at the Joint Statistical Meeting, August 14, 1995, Orlando, FL; printed in *Proceedings of the Government Statistics Section of the American Statistical Association* (Alexandria, VA: American Statistical Association, 1996), pp. 154–59.

PRESENTATION OF INDIVIDUAL QUESTIONS

The questionnaire items discussed below, including all instructions, appear as they did on the 2000 questionnaire. With two exceptions, the items fall into one of four groupings: 100 percent population questions (those asked of every respondent), sample population questions (asked only of randomly selected respondents), 100 percent housing questions, and sample housing questions. The exceptions are the “household roster” questions, which are discussed below, just before the individual population and housing items.

In an effort to maximize the response rate and increase the “user friendliness” of the census form, Census 2000 presented a much simplified questionnaire to respondents. Questions were worded to be as direct and self-explanatory as possible, with instructions kept to a minimum to improve clarity. Respondents received no separate instruction booklet with the mailed questionnaire, as they had in the 1990 census. People seeking a questionnaire in one of several languages other than English (or Spanish in Puerto Rico) could request one in response to a mailed, precensus advance letter from the Census Bureau.

Follow-up enumerators had additional instructions in the *Nonresponse Follow-Up Enumerator Manual*. Because the enumerators’ instructions generally only rephrased or clarified respondents’ instructions, this discussion will mention them only when necessary to explain how the Census Bureau resolved certain special situations. Also, where relevant, this chapter will discuss variables derived from questions and specifications for editing and allocation.

HOUSEHOLD ROSTER QUESTIONS

Question 1. Number of Residents

1 How many people were living or staying in this house, apartment, or mobile home on April 1, 2000?

Number of people

INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2000 who have no other permanent place to stay
- people living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while attending college
- people in a correctional facility, nursing home, or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- people who live or stay at another place most of the time

In comparison with the 1990 census, Census 2000 simplified the residence instructions for including and excluding people—the eight “include” categories in 1990 were reduced to three, and the five “exclude” categories were reduced to four. These instructions helped respondents apply the census residence rules when deciding whom to include in or exclude from the household count.²³

The Census Bureau added this question to the Census 2000 questionnaire to evaluate census coverage. Census analysts compared the response to this question with the roster of household members the respondent provided and with the number of individual responses on the completed questionnaire to determine if information on all household members had been supplied. It also allowed nonre-

sponse follow-up enumerators to check that the number of respondents on which a questionnaire contained information matched the number of people living or staying in the house, apartment, or mobile home.

²³ See Chapter 2, “Planning the Census,” p. 34, for a brief description of the rostering research included in the 1995 Census Test.

Question 2. Names of Residents

2 Please print the names of all the people who you indicated in question 1 were living or staying here on April 1, 2000.

Example — Last Name
J O H N S O N
First Name MI
R O B I N J

Start with the person, or one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here.

Person 1 — Last Name
First Name MI

Person 2 — Last Name
First Name MI

Census 2000, like the 1990 census, asked respondents for their names and the names of all people living in the residence on April 1. Census 2000 simplified the process by eliminating the need for respondents to list people who lived in the residence only occasionally. Both short and long forms of the Census 2000 questionnaire allowed room for twelve people to be listed in a household, though respondents were given room to answer questions on no more than six people.²⁴ If more than six people were listed on a mail return form, a telephone operation called coverage edit follow-up collected information on the remaining individuals.²⁵

100 PERCENT POPULATION QUESTIONS

Question 1. Name

1 What is this person's name? Print the name of Person 1 from page 2.

Last Name
First Name MI

The census included the name as a person's basic identifier and as a means of safeguarding against duplication. From the first census in 1790 through the 1840 census, only the names of family heads were recorded. Beginning in 1850, the census recorded the names of all people in the household except slaves, whose descriptions were recorded on a separate form along with the names of slave owners. Beginning with the 1870 census, enu-

merators recorded the names of all people because the Thirteenth Amendment to the U.S. Constitution dissolved any legal distinction between slaves and free people.

The Census 2000 questionnaire differed from the 1990 questionnaire in its approach to asking respondents to record information for household members. On the 1990 questionnaire, the 100 percent population items were arranged in a matrix format that allowed respondents to answer these questions for each of up to seven household members first, followed by the 100 percent housing questions. For long forms, the sample housing questions came next. The final sections of the sample questionnaire were devoted to the sample population questions. The 2000 questionnaire, however, asked respondents to answer every question (7 on the short form; 53 on the long form) for a particular individual, then do the same for the next individual, and so on until data for

²⁴ The enumerator questionnaires (D-1(E) short form and D-2(E) long form) used in nonresponse follow-up had room for only five respondents.

²⁵ For a description of coverage edit follow-up and other census data collection operations, see Chapter 5, "Data Collection."

all people listed (up to six) had been recorded. The long-form housing questions appeared in the individual section for Person 1. This approach was intended to reduce the possibility for confusion and error by focusing respondents on one person at a time for a sequence of questions, rather than focusing them on one question at a time for a sequence of people.

Census 2000 was the first decennial census to data capture all names reported on all questionnaires.²⁶ Use of names was an important tool for coverage improvement and editing the questions on sex and Hispanic origin. Having names in a machine-readable format made it possible to try to resolve the large number of duplications found in the enumerated population.

Coding. None was required.

Editing and allocation. First names were used to help impute a value for sex when that question was not answered. When a person with a particular first name did not report a sex, the sex reported by the majority of people reporting that same first name was used to assign a sex. All surnames captured were categorized by whether they were Spanish, not Spanish, or indeterminate (or not reported). Determination of whether a particular surname was Spanish was based on the origin given by people who reported that surname. If a surname occurred ten or more times in a state and 85 percent or more of people with this surname reported they were of Spanish origin, that surname was considered to be Spanish. If 85 percent or more of people with this surname reported they were not of Spanish origin, that surname was classified as not Spanish. If less than 85 percent of people reported either Spanish or not Spanish, the surname was considered indeterminate. (See edit procedures for Hispanic origin below.)

Question 2. Household Relationship

2 How is this person related to Person 1?
Mark ☒ ONE box.

☐ Husband/wife
☐ Natural-born son/daughter
☐ Adopted son/daughter
☐ Stepson/stepdaughter
☐ Brother/sister
☐ Father/mother
☐ Grandchild
☐ Parent-in-law
☐ Son-in-law/daughter-in-law
☐ Other relative — Print exact relationship.
| | | | | | | | | |

If NOT RELATED to Person 1:
☐ Roomer, boarder
☐ Housemate, roommate
☐ Unmarried partner
☐ Foster child
☐ Other nonrelative

Relationships were categorized in reference to Person 1. Therefore, Person 1 did not need to answer the relationship question. For Person 1, the Census Bureau used this space to ask for the telephone number at which Person 1 could be contacted.

Relationships between people sharing a residence provided data on living arrangements as well as social and economic characteristics. The federal government required these data to plan for social security needs; to define poverty; and to determine funding needs for programs such as Head Start, the School Breakfast Program, and the Compensatory Education of the Disadvantaged Program.

The census began recording data on the relationships between household members in 1880, though the definition of a family for census purposes at the time was very inclusive—everyone who ate at the same table, including people living alone as sole members of a household. In the tenement houses or “flats” of America’s growing cities, enumerators counted families by counting the dining tables. In

1950, the census distinguished “families” from “households” by noting blood relations or adoption as defining characteristics of a family for census purposes.

²⁶ All the safeguards protecting respondent confidentiality spelled out in Title 13 of the United States Code remained in force. For a description of the confidentiality requirements of Title 13, see Chapter 11, “Legal Issues.” During the 1990 census, the surnames and initials of the first person listed on about 4.7 million questionnaires were data captured via a keying operation. This was done for questionnaires that were returned by residents of multiunit structures and housing units without house number and street name addresses. Nonresponse follow-up enumerators used respondent surnames to help resolve apartment mix-ups caused by misdelivered questionnaires and to assist in locating nonresponse units. See *1990 Census of Population and Housing, History, Part C*, 1990 CPH-R-2C (Washington, DC: Government Printing Office, 1995), p. 8-6.

Over the years, refinements in data collection technology have enabled the census to respond more accurately to changing social conditions. Census 2000 included ten possibilities for family relationship, whereas the 1990 census had offered seven. The 2000 questionnaire separated the category of “adopted son/daughter” from “natural-born son/daughter,” whereas the 1990 census had put these two categories together. Census 2000 also included son-in-law/daughter-in-law and parent-in-law as new categories. Among the categories of “not related,” Census 2000 separated the category of “foster child” from the 1990 category of “roomer, boarder, or foster child” in order to provide a more accurate count of children living in foster care.

Derived variables. The person or individuals occupying a housing unit were termed a “household,” and the reference person (Person 1) was the “householder.” Households were either “family” or “nonfamily.” Family households had at least one person related to Person 1 by birth, marriage, or adoption. The family consisted of the householder and all persons related to him or her. Any other persons in the household not related to the householder by birth, marriage, or adoption were termed “nonrelatives.” A nonfamily household contained a person living alone or with nonrelatives only. A household might include only one family (or none), but could also contain subfamilies (defined below) among the family members.

Families were further classified by family type such as a “married-couple family” when a household member was listed as “husband/wife” of Person 1. Two other family categories frequently used were “families with a male householder, no wife present” and “families with a female householder, no husband present.”

The measure “persons in household” was calculated by dividing all occupants in a household, not just those related to the householder, by the number of occupied housing units. Figures for “persons in household” matched those for “persons in unit” in population and housing tabulations, respectively, based on 100 percent data. In sample tabulations, these figures sometimes differed because of the weighting process. “One-person households” and “persons living alone” were synonymous. “Persons per family” was obtained by dividing the number of persons in families by the total number of families. In cases where individuals in households and families were cross-classified by race or Hispanic origin, household members were typically classified by the race or Hispanic origin of the householder rather than the race or Hispanic origin of each individual. However, the Summary File 2 Supplement contained data for people in households based on the race or Hispanic origin of each individual, rather than on the race or Hispanic origin of the householder.

Enumerators and telephone follow-up clerks received additional instructions in the *Questionnaire Reference Book*. They filled the “husband/wife” box for the person reported as the husband or wife of Person 1. Other married couples might have resided in the household, but the entry for “husband/wife” was filled only for the person reported married to Person 1.

Subfamilies were “families within a family.” A “subfamily” was a family group of two or more persons related to the reference person but not including the reference person or his/her spouse. There were two types of subfamilies: “married-couple” and “parent-child.” A “married-couple” subfamily contained a married couple and their never-married children under 18 years of age, if any. Examples would include the son and daughter-in-law of Person 1 and their never-married child (the grandchild of Person 1) or the mother and father of Person 1. A “parent-child” subfamily contained one parent (with no spouse present) and one or more never-married children under 18 years of age. Examples would include Person 1’s daughter and her never-married children under 18 years (grandchildren of Person 1) or Person 1’s mother and a never-married brother or sister under 18 years of age.

A “natural-born son/daughter” or an “adopted son/daughter” was a son or daughter of Person 1 by birth (or adoption), regardless of the age of the child. If Person 1 was also the stepparent of the adopted child, the category “adopted son/daughter” took precedence over “stepson/stepdaughter.” “Adopted son/daughter” appeared as a separate category and response option in Census 2000, whereas in the 1990 census adopted children had been counted in the same category as natural-born children. Additionally, foster children appeared as a separate category in 2000, having been included with roomers and boarders in the 1990 census.

A “stepson/stepdaughter” was a son or daughter of Person 1 through marriage but not by birth, regardless of the age of the child (excluding sons- and daughters-in-law). If the “stepson/stepdaughter” of Person 1 also was legally adopted by Person 1, he or she was considered an “adopted son/daughter,” not a “stepson/stepdaughter.” In other words, “adopted son/daughter” took precedence over “stepson/stepdaughter.”

A “brother/sister” was either the brother or sister of Person 1 by birth or adoption or the stepbrother or stepsister of Person 1. A “father/mother” was either the parent by birth, the stepparent, or the adoptive parent of Person 1. A “grandchild” was the grandson or granddaughter of Person 1. A “parent-in-law” was either the mother or father of Person 1’s spouse. A “son-in-law/daughter-in-law” was the spouse of Person 1’s daughter or son. “Other relative” included brothers- and sisters-in-law, as well as anyone else related to Person 1, either by blood, marriage, or adoption (such as nephew, aunt, cousin, grandparent, great-grandchild, etc.), and the exact relationship was printed in the space provided. However, Census 2000 counted parents-in-law of Person 1 who lived in the household as a separate category. This differed from the 1990 census which included parents-in-law in the “other relative” category.

A “roomer, boarder” was a roomer, boarder, or lodger not related to Person 1. A “housemate, roommate” was a person who was not related to Person 1 but used common living quarters primarily to share expenses. An “unmarried partner” was a person who was not related to Person 1 but shared living quarters and had a close personal relationship with him or her. “Other nonrelative” referred to any other person who was not related to Person 1 by blood, marriage, or adoption but could not be described by the given categories.

Coding. For respondents marking the “other relative” box on the questionnaire, space was provided to write in the specific relationship of that person to Person 1. For most cases, the written response was automatically coded by scanning and interpreting the written image, matching the interpreted response to a dictionary of names, and then selecting the appropriate final set of relationship coded categories. This dictionary included numerous variations on relationship types (for example, sister, sis), misspellings (soster, sisster, sissterr), and foreign-language equivalents. For those entries that could not be found in the relationship dictionary, the interpreted electronic images of the write-in responses produced by the optical character recognition software were visually interpreted by coders who then assigned the write-in to the predetermined set of responses. Write-in responses which could not be classified were then coded to the “other relative” category. If the write-in clearly indicated that this person was not related to the householder (for example, “best friend”), the coders then assigned the response to the proper nonrelative category.

Editing and allocation. Relationship categories were edited for consistency using the age and sex of the respondent in relation to the householder. Certain criteria were established to ensure that there would not be multiple entries of the same relationships where only one response was acceptable (for example, only one spouse per householder). In addition, age limits were established between people for acceptability of responses (for example, the parent of the householder had to be older than the householder by 15 or more years). In instances where inconsistent or blank responses were noted, items were either assigned on the basis of logical relationships between people or were allocated from matrices based on questionnaires completed with acceptable responses.

A major change in the editing routine of the relationship item between the 1990 census and 2000 census was in the editing of married couples where the householder and the spouse were of the same sex. In 1990, the response of “spouse” was retained but the sex of the spouse was changed to the opposite sex to establish only opposite-sex spouses. In 2000, no change was made in the sex of the spouse, but the relationship category “spouse” of the householder was changed to “unmarried partner” of the householder. A new allocation category, “changed for household consistency,” was added for edits of this type.²⁷ More detailed descriptions of this editing procedure

²⁷ Relationships changed for household consistency were treated as self-reported on the Census 2000 public use microdata sample files.

can be found in the technical note on unmarried partners located at <<http://www.census.gov/prod/cen2000/notes/errata.pdf>> or in the Census 2000 publication *Notes and Errata: 2000*, SF/01-ER, Summary File 1, Technical Documentation, Note 3.

In addition, the relationship item in 2000 was not edited using marital status because marital status was present only on the long form. In 1990 marital status was included on the short form, and its inclusion aided in the editing and allocation of relationship responses.

Question 3. Sex

3 What is this person's sex? Mark ☒ ONE box.

☐ Male

☐ Female

Every census since the first in 1790 has recorded a person's sex (male or female) as a basic population characteristic. Sex refers to the biological categories of male and female. Gender refers to a person's sexual identity and to the constellation of traits or characteristics that a particular society

ascribes to people of a given sex. Prior to 1960, enumerators noted a person's sex by simple observation, by inference (a "wife" was considered female, as was someone with a female name), or by direct questioning as necessary. Starting with the 1960 census, when the census first used the mail extensively to collect data, respondents began recording their own responses, including their sex, on a mail-in census questionnaire. By 1970 about 60 percent of census data was gathered by mail, and by 1980 the percentage had climbed to about 90 percent. The census collects data on sex in part to comply with a variety of legal mandates and requirements, such as laws concerning affirmative action and equal employment opportunity, public health, and veterans' programs ("hot-deck" imputation).²⁸

Coding. None was required.

Editing and allocation. The consistency checks for the relationship, sex, age, and date-of-birth items were conducted jointly to reconcile inconsistencies between each household member's relationship to Person 1 and between the respondent's sex and age. First name was used to impute a sex if none was reported. During the householder edit that involved the question on relationship, there was a consistency check of householder/spouse responses to assure that the householder and spouse entries were for opposite sexes. The edit assigned values for inconsistently reported or missing values based on the values of other variables for that person, from other people in the household, or from people in other households.

Question 4. Age and Date of Birth

4 What is this person's age and what is this person's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

The census has collected data on age since 1790, though in that first census age was used only to divide free white males into those 16 years old and above and those below the age of 16. Subsequent censuses expanded the recording categories, first as age ranges and then, in 1850, as single years. The 1850 census asked people their "age at last birthday," with infants under 1 year of age entered as twelfths of a year (for example, 3 months was recorded as 3/12). The 2000 questionnaire differed

from the 1990 questionnaire in asking for the person's month and day of birth as of Census Day in addition to age and year of birth, thus allowing for a more accurate measure of this item. Minor variations in recording peoples' ages have occurred over the years, as follows:

²⁸ See footnote 9 in this chapter for a definition of hot-deck imputation.

Coding. For the second time during a census, an automated coding system for written responses to the Hispanic-origin question was used in Census 2000. The automated system aimed to reduce the potential for error associated with a clerical review. Using master files containing millions of unique coded written responses from previous censuses and surveys, the system automatically coded more than 90 percent of the written responses if the entry matched an entry already in the master files. Specialists with thorough knowledge of Hispanic-origin categories and classification systems reviewed and coded responses that were not automatically coded.

Editing and allocation. Reediting and editing procedures were used for the Hispanic-origin question. Preediting procedures eliminated duplicate responses and adjudicated other situations where more than one response was provided (only one response was allowed for this question). For Census 2000, if both Hispanic origin and race were missing, they were imputed jointly (in the 1990 census, each response was imputed independently). The 2000 editing procedures could have imputed a value from an ethnic response provided by that person in the question on race, a response from another household member of the same race using a precedence order of household relationships, or a response from another person of the same race and age group in a different household based on whether the person needing an origin had a Spanish surname (hot-deck imputation). The computer software identified people with a reported origin and a Spanish surname as potential donors for origin to the Spanish surname-assisted hot deck.²⁹ For those with a reported origin and a non-Spanish surname, the computer program copied their origin to the non-Spanish surname-assisted hot deck. For all other people with a reported origin, the software identified their origin as potential donors to a non-surname-assisted hot deck. If a person requiring an origin from the hot deck had a Spanish surname, he or she would receive an origin from the Spanish-surname-assisted hot deck. If a person requiring an origin from the hot deck had a non-Spanish surname, he or she would receive an origin from the non-Spanish-surname-assisted hot deck. All other people requiring an origin from the hot deck would receive an origin from the non-surname-assisted hot deck. Census 2000 was the first decennial census to use surname-assisted hot decks.

Question 6. Race

6 What is this person's race? Mark (X) one or more races to indicate what this person considers himself/herself to be.

☐ White

☐ Black, African Am., or Negro

☐ American Indian or Alaska Native — Print name of enrolled or principal tribe. ↗

☐ Asian Indian ☐ Native Hawaiian

☐ Chinese ☐ Guamanian or Chamorro

☐ Filipino ☐ Samoan

☐ Japanese ☐ Other Pacific Islander — Print race. ↗

☐ Korean

☐ Vietnamese

☐ Other Asian — Print race. ↗

☐ Some other race — Print race. ↗

The census has collected data on race since 1790. Race has been an evolving and sensitive concept in American life and has continued to be a required or mandated item in numerous government programs involving affirmative action and equal employment opportunity, civil and voting rights, public health, and veterans' benefits. In 2000, the Census Bureau used a concept of race that did not denote any clear-cut scientific definition of biological stock but instead acknowledged that people often identify with one or more racial groups.

The 1990 questionnaire asked respondents to choose only one racial identification, whereas the 2000 questionnaire allowed for "one or more" racial choices. Census 2000 added the descriptor "African Am." to "Black or Negro," reflecting the increased use of African American as a racial self-identifier. It also modified other categories in order to increase accuracy. It created a single category, "American Indian or Alaska Native," whereas the 1990 census had contained three: "Indian (Amer.)," "Eskimo," and "Aleut." The category of "Other Asian or Pacific Islander," which had

²⁹ For a description of how surnames were classified into Spanish, non-Spanish, and indeterminate, see the "Editing and allocation" section for Question 1 (name and number of people).

appeared for the first time in the 1990 census, was separated into two distinct categories, “Asian” and “Native Hawaiian or Other Pacific Islander.” The category “Hawaiian” became “Native Hawaiian”; “Chamorro” was added to “Guamanian,” as in “Guamanian or Chamorro”; and “Asian Indian” was added to more clearly distinguish it from “American Indian.”

Coding. For the second time during a census, an automated coding system for written responses to the race question was used in Census 2000. The automated system aimed to reduce the potential for error associated with clerical coding. Using master files containing millions of coded written responses from previous censuses and surveys, the system automatically coded the written responses if the entry matched an entry already in the master files. Specialists with thorough knowledge of race categories and classification systems reviewed and coded responses that were not automatically coded.

Editing and allocation. Both preediting and editing procedures were used for the race question. Preediting procedures accomplished the following tasks:

- Eliminated duplicate responses, including situations where write-in responses duplicated checkbox categories, such as checking the “White” box and writing “White” in one of the write-in spaces (in these cases the write-in code was chosen over the checkbox code).
- Selected more-specific responses over more-general responses within the same racial group (for example, if “Asian” and “Laotian” were provided, “Asian” was dropped). This included situations where the respondent provided a general response, such as “Biracial,” in addition to a specific race combination (such as “Black and White”).
- Allowed for regional variations in coding a particular race term.
- Attempted to adjudicate responses of “Indian” into either “American Indian” or “Asian Indian.”
- Eliminated uncodable responses.
- Adjudicated situations where the write-in response was not consistent with checkbox categories that required a write-in response (i.e., “American Indian or Alaska Native,” “Other Asian,” “Other Pacific Islander,” and “Some Other Race”).
- Adjudicated situations where more than eight races were provided.
- Collapsed multiple responses in the “White” and “Black or African American” code range.

Editing procedures imputed a race (1) provided by the person himself or herself in the question on Hispanic origin, (2) provided by other people of the same origin within the household using a precedence order of household relationships, or (3) provided by people of the same origin and age group in another household (hot-deck imputation). If both Hispanic origin and race were missing, they were imputed jointly. (In the 1990 census each response was assigned independently.)

SAMPLE POPULATION QUESTIONS

Question 7. Marital Status

7 What is this person's marital status?

- ☐ Now married
- ☐ Widowed
- ☐ Divorced
- ☐ Separated
- ☐ Never married

A question on marital status first appeared in the 1880 census under the title “Civil Condition,” with four options: single, married, widowed, or divorced. From 1850 through 1890, the census asked whether the person, male or female, had married during the previous year. In 1950 the census added the category “separated” and changed the category “single” to “never married,” as some separated or divorced

people were describing themselves as single. The 1970 questionnaire’s wording on marital status sought further clarity, and achieved its current form, by making the “married” category “now married,” the other statuses being “widowed,” “divorced,” “separated,” or “never married.” In the 1990 census, marital status was one of seven items asked of all respondents; in Census 2000, marital status was only asked of a sample of the population.

Marital status data for people 14 years and older were available from the 1890 census to the 1970 census. Since 1980, marital status data have been published for people 15 years and older. People under age 15 were all categorized as never married regardless of their answers on the census form.

Federal legislation required marital status data for programs involving public health, low-income housing tax credits, and mortgage revenue bonds programs.

Coding. None was required.

Editing and allocation. Marital status was included on only the long form in 2000 and, hence, was edited only after all of the relationship items were first edited and allocated during the processing of the short-form items. Consistency checks were made between the marital status item and the age and relationship responses. In instances where some items were unanswered, responses were either assigned through a logical edit or were allocated from matrices using data filled by previous respondents. Examples of logical assignments included assigning the marital status category “now married” to people who were spouses of householders and the category “never married” to all people under the age of 15.

Unlike in 1990 when marital status was simultaneously edited and allocated in conjunction with the short-form items of age, sex, and relationship, marital status in Census 2000 was edited only after these items were finalized in the previous edit. In instances where the marital status response was inconsistent with the final relationship category (for example, an unmarried partner reporting that he/she was “now married”), the marital status response was rejected and allocated to a category consistent with the relationship response.

Questions 8 and 9: Education

The census has measured education in several ways since 1840, when it included a simple question about basic literacy skills. Starting in 1850, the census supplemented this literacy question with an additional item about school attendance. In 1940, it replaced the literacy question with an item about educational attainment—the highest grade that the person had completed. Thus by 1940 the two measures of education that have been used in every subsequent census—enrollment and attainment—were in place.

Subsequent censuses carried forward the two inquiries about school enrollment and highest grade completed that the 1940 census had introduced, while adding some new items. Type of school (public or private) was first asked in 1960. In 1970 the “private” category was expanded to include “parochial” and “other private,” while the 1980 census used the wording “private, church-related” and “private, not church-related.” Neither the 1990 census nor Census 2000 differentiated between types of private schools. However, the 1990 census shifted the emphasis in educational attainment from highest grade completed to actual degrees earned. This was the first major change in measuring education since 1940 and was continued in Census 2000.

Federal legislation concerning numerous educational programs, voting rights, and bilingual election procedures required the use of education data.

Questions 8a and 8b. School Enrollment and Attendance

8 a. At any time since February 1, 2000, has this person attended regular school or college?
Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

☐ No, has not attended since February 1 → Skip to 9

☐ Yes, public school, public college

☐ Yes, private school, private college

8 b. What grade or level was this person attending?
Mark ☒ ONE box.

☐ Nursery school, preschool

☐ Kindergarten

☐ Grade 1 to grade 4

☐ Grade 5 to grade 8

☐ Grade 9 to grade 12

☐ College undergraduate years (freshman to senior)

☐ Graduate or professional school (for example: medical, dental, or law school)

The 1990 census had asked whether a person had attended school or college since February 1 but did not ask for the exact grade level in which the person was enrolled. Enrollment level was derived using an algorithm based on the level indicated in the response to the educational attainment question. Census 2000 included a two-part question on attendance: first, the fact of attendance (8a); and second, the grade level attended (8b). The question on educational attainment (highest degree or level of school completed), which was essentially unchanged from the 1990 questionnaire, followed this two-part question on attendance and enrollment.

Beginning with the 1950 census, college students were enumerated where they lived while attending college; prior to 1950 they generally were enumerated

at their parental homes. This change should not have affected the comparability of national figures on college enrollment since 1940; however, it may have affected the comparability over time of college enrollment data at subnational (region, state, county) levels.

Coding. No coding was necessary for Questions 8a and 8b.

Editing and allocation. Individuals without a response to the school enrollment questions were imputed a school enrollment status, type, and level by using information from other people who had the same age, race, Hispanic origin, labor force status, and occupation and resided in the same or a nearby area.

Question 9. Educational Attainment

9 What is the highest degree or level of school this person has COMPLETED? Mark ☒ ONE box.
If currently enrolled, mark the previous grade or highest degree received.

☐ No schooling completed

☐ Nursery school to 4th grade

☐ 5th grade or 6th grade

☐ 7th grade or 8th grade

☐ 9th grade

☐ 10th grade

☐ 11th grade

☐ 12th grade, **NO DIPLOMA**

☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)

☐ Some college credit, but less than 1 year

☐ 1 or more years of college, no degree

☐ Associate degree (for example: AA, AS)

☐ Bachelor's degree (for example: BA, AB, BS)

☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)

☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)

☐ Doctorate degree (for example: PhD, EdD)

Census 2000's focus on "highest degree or level of school this person has COMPLETED" continued the change in emphasis on actual degree attainment that the 1990 census had introduced. In prior censuses, degree possession had been inferred from the highest grade completed. However, by 1990 there was evidence that the comparability between years of school and degrees had deteriorated over time. Some individuals, for example, had completed 4 years of college but had not actually been awarded a degree. The increase in postsecondary degrees like associate's, master's, professional, and doctorate had further complicated the prospect of inferring degree possession from highest level completed, as the number of years attended do not necessarily translate into degree level attained. Therefore, comparison of post-1990 data with earlier years is possible only for the levels of high school diploma and bachelor degrees and should be made with caution.

Coding. No coding was necessary for Item 9.

Question 10. Ancestry or Ethnic Origin

The census began collecting data on place of birth in 1850. In 1870 items were added about whether the person's father and mother were foreign-born, and in 1880 the census asked for the specific place of birth for each parent. This information made possible the identification of first- and second-generation Americans, or the "foreign stock" population. One hundred years later, the 1980 census omitted items on parental birthplace and, for the

U.S. Census Bureau

11 a. Does this person speak a language other than English at home?

☐ Yes

☐ No → *Skip to 12*

b. What is this language?

(For example: Korean, Italian, Spanish, Vietnamese)

c. How well does this person speak English?

☐ Very well

☐ Well

☐ Not well

☐ Not at all

A question on language has appeared in all censuses since 1890, except for the 1950 census. Wording of the question and the specific information gathered have varied over time. The 1890 census asked if the person spoke English, and if not, what “language or dialect” was spoken. The 1900 census asked only whether the person could speak English. Censuses from 1910 through 1940 asked about the “mother tongue or native language” of people born outside the United States, their parents’ native language, and the person’s ability to speak English. The 1950 census made no inquiry about language. The 1960 and 1970 censuses asked what language was spoken either in a foreign-born

respondent's home before he or she came to this country (1960) or at home during childhood (1970).

The 1980, 1990, and 2000 censuses shifted the emphasis back to the language spoken in the person's current home, besides English, as well as assessing by self-report the person's English-speaking ability. Several federal laws concerning voting rights and bilingual and adult education required the use of information on language. For example, the Voting Rights Act (42 U.S. Code 1073aa-1a) specified using decennial census data to help make voting materials available in minority languages.

Coding. The write-in responses listed in Question 11b (specific language spoken) were coded into more than 380 detailed language categories using an automated coding system. The automated procedure compared write-in responses reported by respondents with entries in a master code list, which initially contained approximately 2,000 language names, and added variants and misspellings found in the 1990 census. Each write-in response was given a numeric code that was associated with one of the detailed categories in the dictionary. If the respondent listed more than one non-English language, only the first was coded.

Editing and allocation. For a person who indicated that he or she spoke a language other than English at home in Question 11a but failed to specify the name of the language in Question 11b, the language was allocated based on (1) the language of other speakers in the household, (2) the language of a person of the same Spanish origin or detailed race group living in the same or a nearby area, or (3) a person of the same place of birth or ancestry. In all cases where a person was imputed a non-English language, it was assumed that the language was spoken at home. A person for whom a language other than English was entered in Question 11b, and for whom Question 11a was blank, was assumed to speak that other language at home.

Data on ability to speak English were derived from the answers to long-form questionnaire Item 11c. A respondent who reported in long-form questionnaire 11a that he or she spoke a language other than English was asked to indicate ability to speak English by choosing one of the following categories: “very well,” “well,” “not well,” or “not at all.” The data on ability to speak English represented the person’s own perception about his or her own ability or, because census questionnaires were usually completed by one household member, the responses might have represented the perception of the responding household member. Respondents were not instructed on how to interpret the response categories in Item 11c. A person who reported that he or she spoke a language other than English at home, but whose ability to speak English was not reported, was allocated an English-language ability from a person of the same age, Hispanic origin, nativity and year of entry, and language group selected from a sequential, nearest neighbor hot deck.

The following table is an illustration of the content of the classification schemes used to present language data.

Table 3-1.
Classifications (4 Groups and 39 Groups) of Census 2000 Languages Spoken at Home, With Illustrative Examples

4-group classification	39-group classification	Examples
Spanish	Spanish and Spanish Creole	Spanish, Latino
Other Indo-European languages	French French Creole Italian Portuguese and Portuguese Creole German Yiddish Other West Germanic languages Scandinavian languages Greek Russian Polish Serbo-Croatian Other Slavic languages Armenian Persian Gujarati Hindi Urdu Other Indic languages Other Indo-European languages	French, Cajun, Patois Haitian Creole Dutch, Pennsylvania Dutch, Afrikaans Danish, Norwegian, Swedish Serbo-Croatian, Croatian, Serbian Czech, Slovak, Ukrainian Bengali, Marathi, Punjabi, Romany Albanian, Gaelic, Lithuanian, Rumanian
Asian and Pacific Island languages	Chinese Japanese Korean Mon-Khmer, Cambodian Miao, Hmong Thai Laotian Vietnamese Other Asian languages Tagalog Other Pacific Island languages	Cantonese, Formosan, Mandarin Dravidian languages (Malayalam, Telugu, Tamil), Turkish Chamorro, Hawaiian, Ilocano, Indonesian, Samoan
All other languages	Navajo Other Native North American languages Hungarian Arabic Hebrew African languages Other and unspecified languages	Apache, Cherokee, Choctaw, Dakota, Keres, Pima, Yupik Amharic, Ibo, Twi, Yoruba, Bantu, Swahili, Somali Syriac, Finnish, other languages of the Americas, not reported

Question 12. Place of Birth

12 Where was this person born?

☐ In the United States — *Print name of state.*

☐ Outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc.*

The three earliest censuses (1790, 1800, 1810) did not ask about place of birth, and the 1820 through 1840 censuses simply asked whether a person was a “foreigner non-naturalized.” Beginning in 1850, censuses have requested the name of the specific state, territory, or foreign country of birth. Censuses from 1870 through 1970 inquired about parents’ place of birth in addition to the respondent’s place of birth, though the 1870 question concerned only

whether the mother and father were foreign-born and did not ask for their specific place of birth. In 1980, 1990, and 2000 the census omitted questions about parents' birthplace and asked only for the enumerated individual's place of birth.

Place of birth data help distinguish native from foreign-born people. In Census 2000 "native" included people born in the United States, the Commonwealth of Puerto Rico, and other U.S. Island Areas (including Guam, the U.S. Virgin Islands, American Samoa, and the Commonwealth of the Northern Mariana Islands), and individuals born in a foreign country or at sea but having at least one U.S. citizen parent. "Foreign-born" included all individuals who were not U.S. citizens at birth, regardless of their citizenship status in 2000.

Coding. Place-of-birth coding required matching the write-in responses to reference files and attaching a geographic code. The goal of place-of-birth coding was to code responses to a U.S. state, Puerto Rico, a specific U.S. Island Area, or foreign country where the respondents were born. The primary reference file used in geocoding place of birth was the State and Foreign Country File (SFCF), which contained (1) the names and abbreviations of each state, the District of Columbia, Puerto Rico, and the U.S. Island Areas and (2) the official names, alternate names, and abbreviations of foreign countries and selected foreign city, state, county, and regional names. Other reference files (such as a military installation list and city reference file) were available and used in instances where the respondent's information was either inconsistent with the instructions or was incomplete.

Once the write-in responses were captured, either through keying or OCR interpretation, they were matched to the SFCF and other computer-based reference files in an automated computer-coding operation; the responses did not have to match a reference file entry exactly. The coding algorithm allowed for equivocations, such as using Soundex values of letters (for example, m=n, f=ph, etc.) and reversing letter combinations (ie=ei). Each equivocation was assigned a numeric value or confidence level, with exact matches receiving the best score or highest confidence. A preference was given for matches that were consistent with any checkboxes marked and/or response boxes filled. The responses had to match a reference file entry with a relatively high level of confidence in order for the automated match to be accepted. Nearly 99 percent of the place-of-birth responses were matched with an acceptable confidence level during the automated phase of geocoding.

The remaining 1 percent of the place-of-birth responses were coded in a computer-assisted clerical coding (CACC) operation. Clerks used an interactive computer system to search for and select reference file entries that they thought best matched the responses, then the computer assigned the codes associated with that geographic entity. The work units in the CACC operation included a three-way independent quality-control sample of the responses that required clerical coding. The CACC operation included a referral coding unit, a specially trained group of clerks who used additional paper-based and Internet-based reference materials to code responses that could not be resolved using the standard reference files and procedures.

Editing and allocation. A person who did not report place of birth was allocated the birthplace of another family member or the response of another person with similar characteristics. Matching characteristics included age, sex, household relationship, Hispanic origin, race, citizenship, and any responses to the residence-5-years-ago question (migration). A person imputed as being "abroad, not specified" or "born in an outlying area, not specified" during the geocoding process was subsequently allocated a specific country of birth during the imputation process.

Nonresponse was allocated in a similar manner in 1970 through 1990; however, a person allocated as foreign-born was not assigned a specific country of birth but was classified as either "born abroad, country not specified" or "born in an outlying area, not specified." Prior to 1970, nonresponse to the place-of-birth question was not allocated but was shown in tabulations as "not reported"; individuals who did not report place of birth were generally classified as "natives."

Question 13. Citizenship Status

13 Is this person a CITIZEN of the United States?

- ☐ Yes, born in the United States → *Skip to 15a*
- ☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
- ☐ Yes, born abroad of American parent or parents
- ☐ Yes, a U.S. citizen by naturalization
- ☐ No, not a citizen of the United States

An inquiry about U.S. citizenship status appeared in the censuses of 1820 and 1830; in 1870, for males 21 years of age and older; and since 1890, with the exception of 1960. Under special arrangements with the appropriate local governments, the 1960 100 percent questionnaires used in New York City and Puerto Rico included a question on citizenship, and results were tabulated only for those areas.

The census used information on citizenship status to classify the population into U.S. citizens and non-U.S. citizens. Both the 1990 census and Census 2000 classified U.S. citizens further into four subcategories. The first three included U.S. citizens at birth—people born in the United States; those born in the Commonwealth of Puerto Rico, or other U.S. Island Areas (including Guam, the U.S. Virgin Islands, American Samoa, and the Commonwealth of the Northern Mariana Islands); and those born abroad of U.S. citizen parents. The fourth subcategory consisted of naturalized U.S. citizens, that is, people who, by any means, obtained U.S. citizenship after birth.

Coding. No coding was required.

Editing and allocation. For cases where a respondent either did not provide an answer or provided an answer that conflicted with another of his or her Census 2000 responses, such information was edited. Citizenship status and year-of-entry information were edited jointly for Census 2000. To determine what degree of editing (or allocation) was required, responses to citizenship status were first compared with responses to Question 12 (place of birth).

If the respondent indicated in Question 12 that he or she was born in the United States, Puerto Rico, or a U.S. Island Area (such as Guam), but did not provide a response to the citizenship status question, that person was recorded as being a U.S. citizen by birth in the citizenship status question.

If the respondent indicated in Question 12 that he or she was born outside the United States, Puerto Rico, or a U.S. Island Area, but did not provide a response to the citizenship status question, the edit procedure first searched for additional information about other related household members that would provide evidence as to the citizenship status of the respondent. If available, this information was used to impute a citizenship status to the respondent. If this information was not available, the edit procedure allocated citizenship status based on answers from other nonrelated respondents who shared similar characteristics such as age, race/ethnicity, year of entry, and citizenship status (where available).

The editing process of citizenship status and year-of-entry responses differed somewhat depending on whether the respondent lived in a household (e.g., single-family home, apartment, mobile home) or group quarters (institutional and noninstitutional). Answers reported by respondents living in households were edited using information from other relatives living in the same residence, if any were present. Such relationship-specific editing procedures were not used in group quarters as these living arrangements consisted of unrelated people.

Question 14. Year of Entry

14 When did this person come to live in the United States? Print numbers in boxes.

Year

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The 1890 census was the first to gather data on the year of entry into the United States by foreign-born people. It asked foreign-born respondents how long they had been in the United States, then inferred the year of entry from that information. The 1900, 1910, 1920, and 1930 censuses asked foreign-born people directly for their “year of immigration” to the United States. The 1940, 1950, and

1960 censuses made no inquiry into year of entry. The 1970 census resumed collection of information on entry into the United States. As in the two subsequent censuses, the 1970 census

offered ranges of years from which the respondent would select (e.g., 1935–1944 or 1965–1970). It was not until Census 2000 that respondents born outside the United States were asked to write in a specific year of entry.

In addition to asking for specific year-of-entry information, the Census 2000 question on year of entry differed from the 1990 question, changing from “When did this person come to the United States to stay?” (1990) to “When did this person come to live in the United States?” (2000). For Census 2000, a person entering the United States more than once was instructed to enter the latest year he or she came to live in the United States. This instruction was provided to respondents who were interviewed by an enumerator either over the phone or in person, but was not provided to respondents who simply returned the questionnaire through the mail.

Coding. No coding was required.

Editing and allocation. See the “Editing and allocation” section of Question 13 (citizenship status) for a detailed description of this item.

Question 15. Residence 5 Years Ago

15 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?

☐ Person is under 5 years old → *Skip to 33*

☐ Yes, this house → *Skip to 16*

☐ No, outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc., below; then skip to 16.*

☐ No, different house in the United States

15 b. Where did this person live 5 years ago?

Name of city, town, or post office

Did this person live inside the limits of the city or town?

☐ Yes

☐ No, outside the city/town limits

Name of county

Name of state

ZIP Code

Beginning in 1940, the census has gathered data on residential mobility (migration) by asking where respondents lived 5 years earlier and then comparing that location to respondents’ residence at the time of the census. The exception to this was the 1950 census, just 5 years after the end of World War II and demobilization, when inquiry was made about peoples’ residence 1 year earlier instead of 5 years. Legislation concerning state projections of veteran populations required information on residential mobility, though the data were widely used by a variety of planning and policy-making agencies.

Question 15a in Census 2000 served as an initial screen to determine whether a person was a mover, a nonmover, or under 5 years old. This question also determined whether any change of location that had taken place in the preceding 5 years was from a house or apartment outside or inside the United States. If inside the United States, the respondent was directed to Section b of the question, which asked for details about the location. If outside the United States, the respondent was asked for the name of the foreign country or Puerto

Rico or Island Area, and then was directed to the next question. This approach differed slightly from that used in 1990. The 1990 census question about residence 5 years earlier outside the United States had been included in Part b, rather than Part a. In the 2000 format, Part b concerned U.S. locations only, thus making it clearer to the respondent that no town or city names were required if the residence had been outside the United States.

Coding. Migration (residence 5 years ago) coding required matching the write-in responses of state/foreign country, county, city, inside/outside city limits, and ZIP Code given by the respondent to geocoding reference files and then attaching geographic codes to those responses. The goal of migration coding was to code responses to U.S. state (Puerto Rico, U.S. Island Area, or foreign country), U.S. county (municipio in Puerto Rico), minor civil division (MCD) in 12 states, and place (city, town, or post office). The inside/outside city limits indicator and the ZIP Code responses were used in the coding operations but were not a part of the final outgoing geographic codes.

Once the write-in responses were captured, either through keying or optical character recognition interpretation, they were sent through an automated geocoding system. This system was developed to recognize (1) states and statistically equivalent entities; (2) counties and statistically equivalent entities; (3) foreign countries, including (a) provinces in Canada and (b) continents and regions if that was the only information the respondent provided; (4) areas in the city reference file (the place, MCD [in 12 states], county, and state associated with each post office name and ZIP Code in the United States and Puerto Rico); and (5) military installations (including the state, county, MCD [in 12 states], and places for those in the United States and the foreign country for those located abroad).

During the automated coding operation, the responses did not have to match a reference file entry exactly. The coding algorithm allowed for equivocations, such as using Soundex values of letters (for example, m=n, f=ph, etc.) and reversing letter combinations (ie=ei). Each equivocation was assigned a numeric value or confidence level, with exact matches receiving the best score or highest confidence. The responses had to match reference file entries with a relatively high level of confidence in order for the automated match to be accepted. Nearly 96 percent of the migration responses were matched with an acceptable confidence level during the automated phase of geocoding.

The remaining 4 percent of the migration responses were coded in a computer-assisted clerical coding (CACC) operation. Clerks used an interactive computer system to search for and select reference file entries that they thought best matched the responses, then the computer assigned the codes associated with that geographic entity. The work units in the CACC operation included a three-way independent quality-control sample of the responses that required clerical coding. The CACC operation included a referral coding unit, a specially trained group of clerks who used additional paper-based and Internet-based reference materials to code responses that could not be resolved using the standard reference files and procedures.

Editing and allocation. When information on residence in 1995 was incomplete, previous residence for other family members, if available and consistent with partial responses, was used to impute it; if not available, the previous residence of another respondent with similar characteristics for whom complete information had been provided was allocated. Matching characteristics included state of current residence, age, sex, Hispanic origin, race, household relationship, educational attainment, employment status, and metropolitan/nonmetropolitan residence. People imputed to “abroad, not specified” during the geocoding process were subsequently allocated to a specific country of previous residence during the allocation process.

Nonresponse was allocated in a similar manner in 1980 and 1990. However, Census 2000 was the first to impute a specific city or town of previous residence within the United States or a specific foreign country during the allocation process. In 1980 and 1990, only state and county (or state, county, and MCD in the Northeast) were imputed within the United States. Prior to 1980, nonresponse to the migration question was not allocated but was shown in tabulations as “not reported.”

Questions 16 and 17: Disability

Disability questions have been included in numerous censuses since 1830. The conceptual scope of disability in the decennial census environment has varied from one or two questions about one or two specific impairments, as in the 1930 census in which deafness and blindness were the only disability items, to the six concepts of disability collected in Census 2000. In this most recent decennial census, the concept of disability included two distinct elements: the presence of an underlying, identifiable health condition and the identification of a limitation in specified functions or activities.

The 1830 census schedule introduced the concepts of blindness and deafness. The 1840 census added the categories of insanity and “idiocy,” the term used at that time for mental retardation. But it was the 1880 census that first framed the question of disability as a health condition limiting the person’s ability “to attend to ordinary business or duties.” After the 1910 census, which asked about disability in a supplemental questionnaire, inquiries about disability disappeared

from the census until 1970. In a 5 percent sample, that census asked whether a person had a “health or physical condition which limits the *kind* or *amount* of work he can do at a job”; whether his condition kept him from holding “*any* job at all”; and if so, how long he had been thus limited.

While similar to the 1970 census, the 1980 census differed in some significant respects. It added a specific reference to mental condition, specified a time period of 6 months or more for a condition’s duration, and an inquiry about the person’s condition-related difficulties in using public transportation. The transportation question was omitted from the 1990 census due to its limited usefulness.³⁰

In comparison with prior censuses, Census 2000 widened the scope of questions on conditions that interfered with a person’s normal activities to include more than those pertaining to his or her ability to work. Census 2000 included two questions (with a total of six components) that dealt with the impact of health conditions on several types of functions or activities. Such information was widely used by numerous health, housing, transportation, veterans’, and public assistance programs.

Question 16. Sensory and Physical Disability

16	Does this person have any of the following long-lasting conditions:	Yes	No
	a. Blindness, deafness, or a severe vision or hearing impairment?	<input type="checkbox"/>	<input type="checkbox"/>
	b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?	<input type="checkbox"/>	<input type="checkbox"/>

The Census 2000 questionnaire reintroduced specific items about blindness, deafness, and visual and hearing impairments that had been omitted since 1910 (except in supplemental forms in 1920 and 1930).

Coding. No coding was required.

Editing and allocation. Items 16 and 17 were edited together using the same procedure. For each

part of Item 16, entries for people under 5 years of age were removed from consideration. Two allocation matrices for Items 16 and 17 contained fully reported data based on age, sex, employment status, form type, and group quarters type. For a person who had missing data for 16a, 16b, or both, these allocation matrices were used to determine whether the person had any of the following long-lasting conditions: blindness, deafness, or a severe vision or hearing impairment (16a); and a condition that substantially limited one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying (16b).

Question 17. Mental, Self-Care, Go-Outside-Home, and Employment Disability

17	Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:	Yes	No
	a. Learning, remembering, or concentrating?	<input type="checkbox"/>	<input type="checkbox"/>
	b. Dressing, bathing, or getting around inside the home?	<input type="checkbox"/>	<input type="checkbox"/>
	c. (Answer if this person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor’s office?	<input type="checkbox"/>	<input type="checkbox"/>
	d. (Answer if this person is 16 YEARS OLD OR OVER.) Working at a job or business?	<input type="checkbox"/>	<input type="checkbox"/>

Both the 1990 census and Census 2000 recognized that the conceptualization of “disability” was changing and the increasing involvement of people with disabilities in everyday activities meant that limitations may impact more than a person’s ability to work at a job. This broader approach to disabilities included identifying such activities as bathing, dressing, getting around inside the home, and going outside the home unaided. Census 2000 expanded on the 1990 census term “health condition” by specifying “a physical, mental, or emotional condition,” thus making more explicit to respondents the variety of condi-

tions that were included in the concept “health.” The “emotional condition” category, covering mood disorders like depression and bipolar disorder, appeared for the first time in this census. Additionally, Census 2000’s question differed from the 1990 census question by asking about impairment of cognitive functions like memory, learning, and concentration. Such impairments

³⁰ Public transportation planners concluded that the data the question produced were too general to be of real value.

could affect self-care capacity significantly, especially among elderly people. The Census 2000 question restricted the applicability of Parts c and d of Question 17, which focused on the ability to go outside the home alone to shop or visit a doctor's office and the ability to work, to people 16 years and older, thereby providing disability information relevant to adults of all ages.

Coding. No coding was required.

Editing and allocation. Items 16 and 17 were edited together using the same procedure. For Parts a and b of Item 17, the computer program first eliminated consideration of entries for people under 5 years of age. For Parts c and d of Question 17, the computer program first eliminated consideration of entries for people under 16 years old. Two allocation matrices for Items 16 and 17 contained fully reported data based on age, sex, employment status, form type, and group quarters type. For a person 5 years and older who had missing data for 17a, 17b, or both, these matrices were used to allocate whether the person had a condition lasting 6 months or longer that caused difficulty in any of the following activities: learning, remembering, or concentrating (17a); and dressing, bathing, or getting around inside the home (17b). For a person 16 years and older who had missing data for 17c, 17d, or both, these matrices were used to allocate whether the person had a condition lasting 6 months or longer which caused a person difficulty in any of the following activities: going outside the home alone to shop or visit a doctor's office (17c); and working at a job or business (17d).

Question 18. Age Screen

18 Was this person under 15 years of age on April 1, 2000?

☐ Yes → Skip to 33

☐ No

This item was used to screen for individuals 15 years and older, for whom the balance of the inquiries on the questionnaire would be asked, and to inform respondents and enumerators if they were to continue answering questions for a specific person.

The wording of the Census 2000 age screener differed from the 1990 item, which asked, "When was this person born?" The Census 2000 item allowed respondents to answer simply "yes" or "no" without asking the exact birthday.

Coding. No coding was required.

Editing and allocation. The computer used these entries only as indications that subsequent responses for a particular person were either to be ignored or to be edited and/or supplied. Responses to Item 18 involved no tabulation. The entry in 18 was compared with the age found in Item 4 and completed or corrected as necessary. If the person was born before April 1985, the program continued with the next question. If the person was born on or after April 1985, the program skipped the remaining questions for the person and went on to the next person, if any.

Question 19. Grandparents as Caregivers

19 a. Does this person have any of his/her own grandchildren under the age of 18 living in this house or apartment?

☐ Yes

☐ No → Skip to 20a

b. Is this grandparent currently responsible for most of the basic needs of any grandchild(ren) under the age of 18 who live(s) in this house or apartment?

☐ Yes

☐ No → Skip to 20a

c. How long has this grandparent been responsible for the(se) grandchild(ren)? *If the grandparent is financially responsible for more than one grandchild, answer the question for the grandchild for whom the grandparent has been responsible for the longest period of time.*

☐ Less than 6 months

☐ 6 to 11 months

☐ 1 or 2 years

☐ 3 or 4 years

☐ 5 years or more

The question on grandparents as caregivers appeared for the first time in Census 2000. It reflected the widespread perception that social changes such as increases in the number of working parents and single-parent families, and social problems such as drug abuse and chronic unemployment, had shifted primary responsibility for child care in some families from parents to grandparents. Federal legislation passed in 1996 (Public Law 104-193) mandated that the census collect data on grandparents as caregivers.

In accordance with this mandate, the census inquiry aimed to distinguish between “a household in which a grandparent temporarily provides a home for a grandchild for a period of weeks or months during periods of parental distress” and “a household in which a grandparent provides a home for a grandchild and serves as the primary caregiver for the grandchild.” A grandparent could

house a grandchild and his/her working parent(s), for instance, but not be financially responsible for the grandchild. Or a grandparent might house a grandchild and be financially responsible for the grandchild’s basic needs, as in instances where the child’s parent(s) were temporarily unemployed or injured, without becoming the permanent or primary caregiver for the child. Question 19 did not ask respondents to determine permanence; instead, Part c of Question 19 offered five time spans, ranging from less than 6 months to 5 years or more. If the grandparent cared for more than one grandchild, the question asked for information regarding the grandchild for whom he or she had been responsible for the longest period of time.

Coding. No coding was required.

Editing and allocation. The questions relating to the grandparent items were first edited on the basis of the composition of the household. The presence or absence of a potential grandchild in the household for any respondent was first ascertained by examining the relationships of the household members. After qualifying the respondent on this basis, the questions were edited based on the potential age of the grandchild in the household. For example, if a person reported having a grandchild in the household but none under the age of 18 years could be identified, the response was changed to “no.” Similarly, if a person did not respond “yes” to the presence of a grandchild in the household in Item 19a, but the household roster indicated that he or she was a grandparent of a person in the household, the response was then assigned a “yes.”

Because the grandparent-grandchild population is relatively small, whenever a young person under 18 was allocated a relationship category of relative, the edit could potentially identify a grandparent-grandchild combination when none existed. Once a “yes” answer was established based on the household roster, all subsequent items in the series would require an answer and hence could potentially require allocations. These circumstances could account for the relatively high allocation rates for these items in Census 2000.

Question 20. Veteran Status, Period of Active-Duty Military Service, and Years of Active-Duty Military Service

20 a. Has this person ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? *Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.*

☐ Yes, now on active duty

☐ Yes, on active duty in past, but not now

☐ No, training for Reserves or National Guard only → Skip to 21

☐ No, never served in the military → Skip to 21

b. When did this person serve on active duty in the U.S. Armed Forces? Mark ☒ a box for EACH period in which this person served.

☐ April 1995 or later

☐ August 1990 to March 1995 (including Persian Gulf War)

☐ September 1980 to July 1990

☐ May 1975 to August 1980

☐ Vietnam era (August 1964—April 1975)

☐ February 1955 to July 1964

☐ Korean conflict (June 1950—January 1955)

☐ World War II (September 1940—July 1947)

☐ Some other time

c. In total, how many years of active-duty military service has this person had?

☐ Less than 2 years

☐ 2 years or more

The 1840 census asked a question about military pensioners, and the 1890 and 1910 censuses inquired about veterans of the Civil War. In 1890, an item counted the number of veterans and veterans' widows from both the Union and Confederate Armed Forces, though a special schedule for specific information about veterans included only Union survivors "and the widows of such as have died." The 1910 census counted only the number of survivors of the Union and Confederate services, not their widows, and gathered no additional information.

Veteran status inquiries next appeared in 1930 and in every subsequent census. Initial data on veteran service of women were collected in 1980. The 1990 census was the first to count service during World War II as a merchant-marine seaman as active-duty military service, and people with such service were counted as veterans.

The wording of Part a of the three-part veteran status question in Census 2000 differed from the 1990 wording, which asked if the person had ever been on active duty in the U.S. Armed

Forces or had ever been in the Reserves or in the National Guard. By asking instead if the person had ever served on active duty in the U.S. Armed Forces, Reserves, or National Guard, the Census 2000 question clarified for respondents the difference between regular service in the Reserves or National Guard and being called to active duty as a member of the Reserves or the National Guard.

Part B of Question 20, concerning dates of service, also differed from its counterpart in 1990. It dropped the World War I time period (April 1917 to November 1918) and added two others: "August 1990 to March 1995 (including Persian Gulf War)" and "April 1995 or later." Part c, the last part of the question, also differed from the 1990 section, which had been an open-ended inquiry about the total years of active-duty military service. The Census 2000 item offered a more restricted choice of "less than 2 years" and "2 years or more." Federal legislation concerning veterans' benefits, job training, outreach programs, and health care needs required information about veteran status and active duty military service.

Coding. No coding was required.

Editing and allocation. For Question 20a, the edit examined some closely related items to see whether there was any evidence that the person either was serving on active duty at the time of the census or had ever served on active duty prior to that time. If the person's employment status was "Armed Forces," then, unless the response in Question 20a was "no, training for Reserves or National Guard only," the edit made the person's final value for Question 20a "yes, now on active duty." If the person's employment status was not "Armed Forces," and if the person's current or most recent industry was "Armed Forces," or if the person reported one or more periods in Question 20b (period of active duty service), the edit made the person's final value for Question 20a "yes, on active duty in past, but not now." If none of the above conditions was true, then the edit did not change the reported answer to Question 20a; or, if Question 20a was blank, the edit allocated a final value to the person from a hot-deck matrix.

On Question 20b, for nonveterans, the edit made the final value "not in universe." For veterans, the edit rejected a reported period of service if it calculated that the person was too young or too

old to have served in the period. It also rejected unlikely combinations of served and not-served periods, such as served in World War II and post-September 1980, but not in between. After making these checks, the edit gave veterans a final value of “served in period” to any not-rejected reported period and gave “did not serve” to all other periods. If all periods were unreported or rejected, the edit imputed a final value for each period in a joint hot-deck allocation procedure.

On Question 20c, for nonveterans, the edit made the final value “not in universe.” For veterans, the edit did not change the reported answer. If the response was blank, the edit imputed a final value in a hot-deck allocation procedure.

Questions 21 Through 32: Employment, Commuting, Income

Questions 21 through 32 concerned employment, transportation to work, and income. This series of questions provided information needed to classify the entire working-age population into categories showing the labor force status of the nation, as well as information crucial to assessing the nation’s patterns of commuting and its transportation needs. Additionally, questions about income were useful in providing accurate data for economic planning and analysis and in deriving poverty status. Federal laws concerning such areas as education, job training, housing, civil rights, home mortgages, energy assistance, waste disposal, guaranteed commercial loans, highway planning, transit grants, and clean air either required or mandated the use of data on employment, transportation, and income.

Question 21. Employment Last Week

21 **LAST WEEK, did this person do ANY work for either pay or profit?** Mark ☒ the “Yes” box even if the person worked only 1 hour, or helped without pay in a family business or farm for 15 hours or more, or was on active duty in the Armed Forces.

☐ Yes
☐ No → Skip to 25a

This item differed from its equivalent in the 1990 census in both wording and structure. It asked, “LAST WEEK, did this person do ANY work for either pay or profit,” whereas the 1990 question asked, “Did this person work at any time LAST WEEK?” The Census 2000 wording clarified for respondents the distinction between work (for pay or profit) and volunteer or other nonworkforce activity. The reason

for the change was to make the census question conform with the corresponding question on the Current Population Survey. Additionally, the Census 2000 item omitted the 1990 question’s second section asking for the number of hours worked during the last week. A separate question in both Census 2000 and the 1990 census gathered similar data on the weeks worked and usual hours per week worked in the last calendar year.

Question 22. Place of Work

[illegible]

The 1960 census was the first to ask a “place of work” question, which included only the workplace city, county, and state. This question applied to respondents 16 years and older who indicated in Question 21 (employment last week) that they had done any work for pay or profit in the previous week. It referred to the actual geographical location of the plant, office, store, or other workplace where the person worked most of the time during the week. The question in Census 2000 was essentially unchanged from the 1990 question, though it added the response option of having worked mostly in a foreign country during the previous week (22e).

Coding. Place-of-work coding required matching the write-in responses of structure number and street name address, place, inside/outside city limits, county, state/foreign country, and ZIP Code for an individual to reference files and attaching geographic codes to those responses. If the street address location information that was provided by the respondent was inadequate for geocoding, the employer's name in Question

28 often provided the necessary additional information. The inside/outside city limits indicator and the ZIP Code responses were used in the coding operations but were not a part of the final outgoing geographic codes.

Once the write-in responses were captured, either through keying or optical character recognition interpretation, they were sent through the automated geocoding systems. The place-of-work geocoding systems consisted of two distinct operations. First, each individual's response was geocoded to the place level. This place-level geocoding system was developed to recognize (1) states and statistically equivalent entities; (2) counties and statistical equivalent entities; (3) foreign countries, including (a) provinces in Canada and (b) continents and regions if that was the only information the respondent provided; (4) areas in the city reference file (the place, MCD [in 12 states], county, and state associated with each post office name and ZIP Code in the United States and Puerto Rico); and (5) military installations (including the state, county, MCD [in 12 states], and places for those in the United States and the foreign country for those located abroad). Subsequently, street address, employer name information, and any other physical location information was sent through further automated geocoding. The reference files used for block-level coding included (1) an address file, a special extract from the Topologically Integrated Geographic Encoding and Referencing® database that included address ranges related to block face and higher-level geography and (2) a workplace file, a list of employer and workplace locations, including their street addresses, created from multiple sources such as purchased electronic telephone books and shopping center directories, military installations lists, colleges and universities, as well as from the input of more than 200 metropolitan planning organizations.

During the automated coding operations, the responses did not have to match a reference file entry exactly. The coding algorithm allowed for equivocations, such as using Soundex values of letters (for example, m=n, f=ph, etc.) and reversing letter combinations (ie=ei). Each equivocation was assigned a numeric value or confidence level, with exact matches receiving the best score or highest confidence. The responses had to match reference file entries with a relatively high level of confidence in order for the automated (computer) match to be accepted. Nearly 97 percent of the place-of-work responses were matched with an acceptable confidence level during the automated phase of place-level geocoding and almost 55 percent of the entries at the block level.

The remaining place-of-work responses were coded in computer-assisted clerical coding (CACC) operations, one operation to code to the place level and one to code to the block level. Clerks used interactive computer systems to search for and select reference file entries that they thought best matched the responses, then the computer program assigned the codes associated with that geographic entity. The work units in the CACC operations included a three-way independent quality-control sample of the responses that required clerical coding. Both the place-of-work place-level and block-level CACC operations included referral coding units, groups of specially trained clerks who used additional paper-, Internet-, and geographic information systems-based reference materials to code responses that were not resolved using the standard reference files and procedures.

Editing and allocation. Data on place of work were edited to be consistent with responses on employment status. That is, nonworkers were set as “not in universe.” When place of work was not reported for an individual, or the response was incomplete, a work location was allocated for that worker from that of another respondent with similar characteristics for whom complete information had been provided. Matching characteristics included employment status, means of transportation to work, travel time to work, industry, location of residence, and the workplace of others. Workplace information was always reported or allocated down to the place level within the United States and Puerto Rico but was not always available or possible below that level (census tract and block level). People classified as “abroad, not specified” either during coding or allocation were not assigned to a specific country during the allocation process. Place of work was allocated in a similar manner in 1990; however, prior to 1990, nonresponse to the place-of-work question was not allocated but was shown in tabulations as “not reported.”

Question 23. Means of Transportation to Work and Private Vehicle Occupancy (Carpooling)

23 a. How did this person usually get to work LAST WEEK? *If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

☐ Car, truck, or van
☐ Bus or trolley bus
☐ Streetcar or trolley car
☐ Subway or elevated
☐ Railroad
☐ Ferryboat
☐ Taxicab
☐ Motorcycle
☐ Bicycle
☐ Walked
☐ Worked at home → *Skip to 27*
☐ Other method

23 b. How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

☐ Drove alone
☐ 2 people
☐ 3 people
☐ 4 people
☐ 5 or 6 people
☐ 7 or more people

While censuses starting with 1960 have collected data on the means of transportation to work, those data have not been entirely comparable because the 1980 census added four answer options—“truck,” “van,” “motorcycle,” and “bicycle”—and the 1990 census added “ferryboat” while combining “car, truck, or van” into one option. Part a of the Census 2000 question was essentially the same as its 1990 equivalent. Part b of the Census 2000 question differed in that it reduced the answer options from eight to six by combining 1990’s four options for over 4 people in a car pool (“5,” “6,” “7 to 9,” and “10 or more”) into two (“5 or 6” and “7 or more”).

Coding. No coding was required.

Editing and allocation. Data on means of transportation and private vehicle occupancy (carpooling) were edited to be consistent with employment status responses. That is, nonworkers were set as “not in universe” on both means of transportation and private vehicle occupancy items. Workers who did not report their means of transportation to work as “car, truck, or van” were also set as “not

in universe” on the private vehicle occupancy item. Unreported or incomplete responses for these items were allocated based on the individual’s employment status, sex, race, metropolitan status of current residence, and the means of transportation and vehicle occupancy of this and other persons.

Nonresponse for means of transportation to work was allocated in a similar manner in 1970, 1980, and 1990. However, the categories presented varied somewhat from census to census,

making comparisons rather difficult. In the 1970 census, the means-of- transportation item included “driver, private auto” and “passenger, private auto” as an approximation of carpooling. In the 1960 census, the means of transportation question included a single category, “private auto or car pool.” Prior to 1970, nonresponse to the means-of-transportation question was not allocated but was shown in tabulations as “not reported.”

Question 24. Time of Departure From Home and Travel Time to Work

24 a. What time did this person usually leave home to go to work LAST WEEK?

☐ a.m. ☐ p.m.

b. How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes

The 1980 census was the first to inquire about travel time to work, reflecting an increasing national concern over the combined effects of population density, development, and air pollution on usual patterns of commuting. Travel time referred to the total number of minutes usually spent traveling from home to work (one way) during the previous week. In 1990, the time of departure from home was added in order to quantify the observation that workers were leaving home earlier to compensate for increased amounts of time

spent commuting. Travel time was calculated from door-to-door and included time spent waiting for public transportation, picking up passengers in car pools, etc. Because many commuters, such as those using public transportation or car pool riders who never drove, could not report accurately the exact distance of their trip from home to work, travel time gave a better approximation of relative distance to work and relative efficiency of various transportation modes.

Coding. No coding was required.

Editing and allocation. Data on departure time and travel time to work (minutes) were edited to be consistent with responses from the employment status item and means-of-transportation-to-work item. Thus, nonworkers were set as “not in universe” on both time of departure and travel time to work. Also, workers who reported in Question 23 that they worked at home were set as “not in universe” for departure time and travel time to work. Unreported or incomplete responses for these items were allocated based on the individual’s employment status, sex, race, metropolitan status of current residence, means of transportation, vehicle occupancy, and information on departure time or travel time of this and other persons.

Departure time was converted from the input values of hour and minutes with a.m./p.m. indicators to military time (2400 is midnight). The maximum allowed value for travel time to work was set at 200 minutes in Census 2000, whereas the maximum value captured during the 1990 and 1980 censuses was 99 minutes.

Question 25. Layoff/Work Absence/Recall/Job Search/Availability Last Week

- 25** a. **LAST WEEK, was this person on layoff from a job?**
- ☐ Yes → *Skip to 25c*
- ☐ No
- b. **LAST WEEK, was this person TEMPORARILY absent from a job or business?**
- ☐ Yes, on vacation, temporary illness, labor dispute, etc. → *Skip to 26*
- ☐ No → *Skip to 25d*
- c. **Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?**
- ☐ Yes → *Skip to 25e*
- ☐ No
- d. **Has this person been looking for work during the last 4 weeks?**
- ☐ Yes
- ☐ No → *Skip to 26*
- e. **LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?**
- ☐ Yes, could have gone to work
- ☐ No, because of own temporary illness
- ☐ No, because of all other reasons (*in school, etc.*)

Census 2000 asked this five-part question in place of the two questions (with a combined total of three parts) that the 1990 census used to gather information on absent or unemployed workers. The 1990 item asking about temporary absence or layoff from work in the last week became two separate items in Census 2000, one concerning layoff status (25a) and one concerning temporary absence (25b). This allowed for a clearer distinction between absence due to layoff versus absence due to vacation, sickness, family needs, or other exigencies. The third part (25c) was new and asked if the laid-off person had been informed about going back to work “within the next 6 months OR been given a date to return to work?” The remaining parts of the question (25d and 25e) were essentially the same as in 1990 and inquired about the person’s ability to have started a job if offered one “LAST WEEK.” However, the Census 2000 answer options to this part omitted one of the options presented in 1990—“no, already has a job.”

The two questions—work during the previous week (21) and layoffs, absences, and job search and availability (25)—were used together with Item 27 (industry, from which Armed Forces status was derived) and other economic items to classify the person’s employment status in the “reference week.” The reference week referred to the calendar week preceding the date on which a respondent completed the questionnaire or was interviewed by an enumerator. It was not the same for all respondents since the enumeration was not completed in one week. The labor force status categories, defined in subsequent sections, may be diagrammed as follows:

Labor force

Armed Forces, at work

Armed Forces, with a job but not at work

Civilian labor force

Employed, at work

Employed, with a job but not at work

Unemployed

Not in the labor force

The 1880, 1890, and 1900 censuses inquired about the number of months the person had been unemployed in the previous census year. The 1910 census added an inquiry as to whether the person was unemployed on the date of the census (April 15). Questions about unemployment appeared in every census from 1930 onward. The 1930 census included a special census on unemployment, in accordance with legislation passed on June 18, 1929, that reflected widespread concern over rising levels of unemployment in the late 1920s. That situation rapidly worsened after the stock market crash that occurred a few months later. In 1940, 1950, and 1960, data were presented for people 14 years and older and in 1970 and afterwards for people 16 years and older. In 1970, tabulations for 14- and 15-year-olds allowed comparability with earlier censuses; in 1980, 1990, and 2000 the data were collected for 15-year-olds but tabulated in general for people 16 years and older.

“Labor force” referred to everyone in the Armed Forces or in the civilian labor force. The “Armed Forces” comprised people 17 years and older on active duty in the U.S. Army, Air Force, Navy, Marine Corps, or Coast Guard, but not members of the merchant marine or civilian employees of the U.S. Department of Defense. The “Armed Forces” designation was made using information from Question 28 (occupation) or information about the type of group quarters in which the person resided.

The “civilian labor force” was made up of employed and unemployed civilians. “Employed” referred to people 16 years and older who were either (a) “at work”: those who did any work at all as paid employees, in their own business or profession, on their own farm, or for 15 or more hours as unpaid workers in a family business or farm or (b) “with a job but not at work”: those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons. “Employed” excluded respondents whose only activity consisted of work around the house or volunteer work for religious, charitable, and similar organizations. “Unemployed” civilians were those, age 16 and older, who were neither “at work” nor “with a job, but not at work” and who were looking for work during the previous 4 weeks and available to accept work. Examples of job-seeking included registering at a public or private employment office, meeting with prospective employers, investigating possibilities for starting a professional practice or opening a business, placing or answering advertisements, writing letters of application, and being on a union or professional register. Also included as unemployed were civilians 16 years and older who did not work at all during the reference week, were on temporary layoff from a job, had been informed that they would be recalled to work within the next 6 months or had been given a date to return to work, and were available to return to work during the reference week, except for temporary illness.

“Not in the labor force” encompassed people 16 years and older who were not classified as members of the labor force under the definitions outlined above. This category consisted mainly of students, housewives, retired workers, seasonal workers enumerated in an “off” season who were not looking for work, institutionalized people, and individuals doing only incidental unpaid family work (that is, fewer than 15 hours during the reference week). Also included were the so-called “discouraged workers” who did not have a job and had not actively looked for work during the previous 4 weeks.

A error in the data capture system seems to have adversely affected the labor force data in Census 2000 for about 15 percent, or around 500,000 people, of the civilian noninstitutional population 16 years and older in the United States residing in group quarters. The data capture system apparently created erroneous answers to a specific set of labor force items on the long form Individual Census Report used by residents of civilian noninstitutional group quarters. This phenomenon had an impact on labor force statistics for the entire country, but its effects were most visible and substantial for places, such as college towns, with high concentrations of people living in civilian noninstitutional group quarters. The Census Bureau estimated that the major effects of this problem were to incorrectly decrease the number of employed people and those not in the labor force and to increase both the number of unemployed people and the unemployment rate.³¹

Coding. No coding was required.

Editing and allocation. Data for unreported or incomplete employment-status responses (Questions 21 and 25) were imputed by allocating the employment status of a person with similar characteristics (e.g., age, sex, household relationship, school enrollment, educational attainment, and presence and age of own children).

The edit classified the employment status of people under 16 years of age as “not in universe.” People whose industry was “active-duty Armed Forces” were given an employment status of “Armed Forces.” Civilians who answered “yes” to Question 21 were made “employed, at work”;

³¹ See U.S. Census Bureau, Sandra Lockett Clark, John Iceland, Thomas Palumbo, Kirby Posey, and Mai Weismantle, “Comparing Employment, Income, and Poverty: Census 2000 and the Current Population Survey,” Appendix 3 “Problem in Employment Estimates for Population in Group Quarters,” September 2003; U.S. Census Bureau, “Summary File 3, Data Note 4—Updated April 2006”; and Susan Love and Donald Dalzell, “Researching the Williamsburg Pattern in Census 2000 Labor Force Responses,” February 17, 2006.

those who answered “no” to Question 21 but “yes” to Question 25b were made “employed, with a job, but not at work.” Civilians who did not work in the reference week (answer of “no” in Question 21), but who were available to start or return to a job (“yes” or “no, because of all other reasons” in Question 25e), and who either (a) were on layoff (“yes” in Question 25a) and expected to be recalled to work (“yes” in Question 25c), or (b) looked for work in the last 4 weeks (“yes” in Question 25d), were classified as “unemployed.” The edit made all other civilians who completely answered Questions 21 and 25 “not in labor force.” All other people were either assigned to one of the above categories, if one could be reasonably surmised from the incomplete answers, or imputed to a category using a hot-deck allocation procedure, if one could not.

Question 26. Year Last Worked

- 26** When did this person last work, even for a few days?
- ☐ 1995 to 2000
 - ☐ 1994 or earlier, or never worked → *Skip to 31*

Every census from 1960 onward inquired about the year that the person had last worked. The census asked this question of all individuals who did not work during the reference week (that is, had a “no” response in Question 21 on work status last week). The question served primarily as a screening device for the industry, occupation, class-of-worker, and

work experience items (see Questions 27 to 30 below) so that respondents who had never worked or had last worked more than 5 years ago were not asked to answer them. Screening out those questions reduced the burden on respondents and processing costs. Furthermore, information obtained from this item helped to classify respondents in an employment-status category when entries to some of the other items were missing or inconsistent. The Census 2000 question wording was identical to its 1990 equivalent, though the answer options were reduced from seven (including specific years and ranges of years) to two ranges (“1995 to 2000” and “1994 or earlier, or never worked”). Combining “never worked” with “1994 or earlier” in 2000 was particularly significant because it meant the Census Bureau was no longer able to construct the category “experienced civilian labor force.”

Coding. No coding was required.

Editing and allocation. This question was edited for consistency with the employment-status classification and with the response to Question 30. The edit program classified people under 16 years of age as “not in universe”; it gave employed people and people who reported “yes” in question 30 a final value of “1995 to 2000.” It made the final value for all other people who responded to the item equal to their reported value. It imputed a value to people who did not respond to the question, using a hot-deck allocation procedure in conjunction with allocation for missing entries to Questions 27 to 31.

Question 27. Industry or Employer

27

Industry or Employer — Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.

a. For whom did this person work? If now on active duty in the Armed Forces, mark ☒ this box → ☐ and print the branch of the Armed Forces.

Name of company, business, or other employer

b. What kind of business or industry was this? Describe the activity at location where employed. (For example: hospital, newspaper publishing, mail order house, auto repair shop, bank)

c. Is this mainly — Mark ☒ ONE box.

☐ Manufacturing?

☐ Wholesale trade?

☐ Retail trade?

☐ Other (agriculture, construction, service, government, etc.)?

The 1820 census first gathered data on industry, inquiring about the number of people, free and slave, engaged in agriculture, commerce, and manufacturing. The 1840 census also inquired about industry, but neither the 1820 nor 1840 censuses attempted to distinguish very carefully between the general category of a person's employment and his or her specific job within that area. The 1910 census was the first to formalize such a distinction (see Question 28), one that has been made in every subsequent census.

The 1980 and 1990 questionnaires inserted a brief “instruction box” before the three questions covering industry or employer, occupation, and class of worker. The Census 2000 questionnaire dispensed with this box and gave separate instructions for each of the three questions. The questions were asked on a sample basis of all respondents 16 years and older who had worked in the past 5 years. Respondents therefore included employed people, unemployed people who had worked sometime during the previous 5 years (part of the experienced unemployed), and people who had worked sometime during the past 5 years but were not currently in the labor force (labor reserve). Data for this last group were obtained as a byproduct of asking this information of the unemployed.

Each of the three questions related to the same job, that is, the person's chief job activity or business. For an employed person, the information referred to the job held during the reference week (the full calendar week immediately preceding the day the person or the enumerator completed the questionnaire, which was not necessarily the week including April 1). A person employed at two or more jobs was to report the job at which he or she worked the greatest number of hours during the reference week. For an experienced unemployed respondent and for an experienced respondent not in the labor force, the data referred to the last job held within the previous 5 years.

Question 27a was used to help classify responses to 27b on kind of business or industry. People working for an individual or business with no company name were asked to enter the employer's name; respondents working in their own businesses wrote in "self-employed." Question 27 was the census's primary means, along with type of group quarters, of identifying whether an individual was currently on active duty in the Armed Forces, an identification essential for determining a person's labor force status.

Continuing a historical practice, Question 27b (kind of business or industry) was the primary industry item. The combination of the write-in response to this item and the company name was converted into a three-digit code for classification purposes (see “Coding” below). Respondents were instructed to print the type of activity engaged in by the business, industry, or individual employer recorded in Question 27a, that is, what was made, what was sold, or what service was provided. If more than one activity took place, they were to describe the major activity at the place of work. The 2000 question was identical to the 1990 question, except the examples “auto repair shop” and “bank” replaced “auto engine manufacturing” and “retail bakery.”

Question 27c (industry sector) served as a tool for obtaining accurate industry codes for the three major industry groups of manufacturing, wholesale trade, and retail trade. This was needed because these three major industry groups made or sold the same products. For example, if the

Question 29. Class of Worker

- 29** Was this person — Mark ☒ ONE box.
- ☐ Employee of a PRIVATE-FOR-PROFIT company or business or of an individual, for wages, salary, or commissions
 - ☐ Employee of a PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization
 - ☐ Local GOVERNMENT employee (*city, county, etc.*)
 - ☐ State GOVERNMENT employee
 - ☐ Federal GOVERNMENT employee
 - ☐ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm
 - ☐ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm
 - ☐ Working WITHOUT PAY in family business or farm

In addition to formalizing separate inquiries about industry and occupation, the 1910 census was also the first to ask about the class of worker. In that census, the categories were “employer, employee, or working on own account.” Every subsequent census recorded this information in different ways. The 1950, 1960, and 1970 censuses, for example, categorized people as working for private employers, for government, in their own business, or without pay on a family farm or business. The 1970 census introduced three categories of government work (federal, state, and local) while the 1990 census reversed the order of presentation of these three categories: local, state, and federal. The 1990 ques-

tion included two additional distinctions, between “private for profit” and “private not-for-profit” and between self-employment in an incorporated versus a nonincorporated business, professional practice, or farm. This raised the number of worker classes to eight. The 2000 question was identical to the 1990 question.

Question 29 rounded out the series on job-description items. Unlike the industry and occupation questions, it did not require coding but was reviewed by the coders, along with the person’s industry and occupation entries, to ensure consistent responses.

Historically, the class-of-worker question yielded higher figures for federal government employees when compared with other sources, such as records from the U.S. Office of Personnel Management (OPM). Part of this difference has been attributed to the fact that the census question, unlike data from OPM, counted “nonappropriated funds” employees as federal workers. Such employees worked in military commissaries and base or post exchanges and were paid from revenues generated by those facilities. A second reason was that the Census Bureau counted approximately 500,000 temporary census workers hired to conduct all phases of its own census enumeration and data processing operation as federal employees, whereas OPM did not. Employees of federal government corporations, such as the Tennessee Valley Authority, represented a third component of the census class-of-worker category excluded in data from other sources. Lastly, employees of quasi-governmental entities like AMTRAK and the Federal Reserve Bank were classified as federal employees because these entities are federal government agencies and institutions that are owned by the federal government or partially owned and controlled by the federal government.

Coding. The data on industry, occupation, and class of worker were derived from answers to long-form questionnaire Items 27, 28, and 29 respectively. These questions were asked of a sample of the population 15 years and over. Information on industry related to the kind of business conducted by a person’s employing organization; occupation described the kind of work a person did on the job.

For an employed person, the data referred to the person’s job during the reference week. For someone who worked at two or more jobs, the data referred to the job at which the person worked the greatest number of hours. For an unemployed person, the data referred to the last job. The industry and occupation statistics were derived from the detailed classification systems developed for Census 2000 as described below.

Respondents provided the data for the tabulations by writing on the questionnaire descriptions of their industry and occupation (I&O). These descriptions were data captured and sent to an automated coder (computer software) that assigned a portion of the written entries to categories in the classification system. The automated system assigned codes to 59 percent of the industry entries and 56 percent of the occupation entries.

Those cases not coded by the computer were referred to clerical staff in the Census Bureau’s National Processing Center (NPC) in Jeffersonville, IN, for coding. A new training system was

developed for Census 2000 to create an effective training mechanism combining examples from the I&O coding procedures with the principles of coding I&O. The interactive training software had a built-in help system that allowed the coders to look up information covered during their training.

The first part of the clerical coding process was called “residual coding” (the residual from the autocoder process). For the clerical I&O coding, a computer-assisted coding system similar to the one used in 1990 was designed. This new computer system displayed the questionnaire responses to the I&O items, the employer name list (ENL) for each geographic area, and I&O indexes. A new feature was a help system that contained the I&O coding procedures and flow charts. The clerical staff converted the questionnaire response descriptions to codes by comparing these descriptions to entries in the automated *Alphabetical Index of Industries and Occupations*. For the industry code, these coders also referred to the ENL. This list, prepared from the American Business Index, contained the names of business establishments and their North American Industry Classification System (NAICS) designation. The ENL converted the individual company’s NAICS designation to census codes (see below for a description of the classification system used in Census 2000 industry coding), thereby facilitating coding and maintaining industry classification comparability.

The occupations of people in the Armed Forces were coded along with the civilian population in 2000, as opposed to being coded separately as they were in 1990. These written descriptions from Military Census Reports or Shipboard Census Reports were also referred to the clerical staff in NPC. The clerical staff converted these entries in the military index by military specialty occupations code or military title. If a military occupation had the same occupational title as its civilian equivalent, the same process mentioned above was used for civilian coding, and these codes were then converted to population census equivalents.

The last step in the coding process was problem referral coding. During the referral coding process, the referralists researched responses that neither the autocoder system nor the residual coders were able to code. The problem referralists were the last decision makers in the coding process. These referralists used other research methods and materials to assist in assigning I&O codes. These materials included the *NAICS Manual*, the *Standard Occupational Classification (SOC) Manual*, the Dun and Bradstreet directories, and other online, electronic reference files. All cases that remained uncoded until this final stage were coded.

Classification systems for coding. The industry classification system used for Census 2000 consisted of 265 industry categories, classified into 14 major industry groups. Since 1940, the industrial classification was based on the *Standard Industrial Classification (SIC) Manual*. The Census 2000 classification was developed from the 1997 North American Industry Classification System (NAICS) published by the U.S. Office of Management and Budget, Executive Office of the President. NAICS was an industry description system that grouped establishments into industries based on the activities in which they were primarily engaged.

The NAICS differed from most industry classifications because it was a supply-based, or production-oriented, economic concept. Census data, which were collected from households, differ in detail and nature from those obtained from establishment surveys. Therefore, the census classification systems, while defined in NAICS terms, did not reflect the full detail in all categories.

The NAICS showed a more detailed hierarchical structure than that used for Census 2000. The expansion from 11 divisions in the SIC to 20 sectors in the NAICS provided groupings that were meaningful and useful for economic analysis. Various statistical applications that previously sampled or published at the SIC levels faced problems with the coverage for 20 sectors instead of 11 divisions. These statistical programs requested an alternative aggregation structure for production purposes, which was approved and issued on May 15, 2001, in the clarification Memorandum No. 2, “NAICS Alternate Aggregation Structure for Use by United States Statistical Agencies.” Several census data products used the alternative aggregation, while others used more detail.

The occupational classification system used during Census 2000 consisted of 509 specific occupational categories for employed people arranged into 23 major occupational groups. This classification was developed based on the *Standard Occupational Classification (SOC) Manual: 2000*,

which included the 23 major occupational groups divided into 96 minor groups, 449 broad groups, and 821 detailed occupations. For Census 2000 tabulations with occupation as the primary characteristic, several levels of occupational detail were shown.

Some occupational groups were related closely to certain industries. Operators of transportation equipment, farm operators and workers, and health care providers accounted for major portions of their respective industries of transportation, agriculture, and health care. However, the industry categories included people in other occupations. For example, people employed in agriculture included truck drivers and bookkeepers; people employed in the transportation industry included mechanics, freight handlers, and payroll clerks; and people employed in the health care industry included security guards and secretaries.

Editing and allocation. There was a computer edit and allocation process. The edit program first determined whether a respondent was in the universe that required an industry and occupation code. The codes for the three items—industry, occupation, and class of worker—were checked to ensure their validity and edited for their relation to each other. Invalid and inconsistent codes were either blanked or changed to consistent ones.

If at least one of the three codes was blank after the edit, a code was allocated from a “similar” person based on other items, such as age, sex, education, residence, and weeks worked. If all of the work experience and income data for a respondent were also blank, all these economic items were allocated from one other person for whom the census already had all the necessary data.

Comparability. Comparability of industry and occupation data was affected by a number of factors, primarily the systems used to classify the questionnaire responses. For both the industry and occupation classification systems, the basic structures were generally the same from 1940 to 1970, but changes in the individual categories limited comparability of the data from one census to another. These changes were needed to recognize the “birth” of new industries and occupations, the “death” of others, the growth and decline in existing industries and occupations, and the desire of analysts and other users for more detail in the presentation of the data. Probably the greatest cause of incomparability was the movement of a segment of a category to a different category in the next census. Changes in the nature of jobs and respondent terminology, and refinement of category composition, made these movements necessary. The 1990 occupational classification system was essentially the same as that used for the 1980 census. However, the industry classification had minor changes between 1980 and 1990 that reflected changes to the SIC.

In Census 2000, both the industry and occupation classifications experienced major revisions to reflect changes to the NAICS and the SOC. The conversion of the census classifications in 2000 meant that the 2000 classification systems were not directly comparable to the classifications used in the 1990 census and earlier.

Other factors that affected data comparability over the decades included the universe to which the data referred (in 1970, the age cutoff for labor force was changed from 14 years to 16 years); the wording of the industry and occupation questions on the questionnaire (for example, important changes were made in 1970); and improvements in the coding procedures (the ENL technique was introduced in 1960). How the “not reported” cases were handled was also a factor. Prior to 1970, they were placed in the residual categories “industry not reported” and “occupation not reported.” In 1970, an allocation process was introduced that assigned these cases to major groups. In Census 2000, as in 1980 and 1990, the “not reported” cases were assigned to individual categories. Therefore, the 1980, 1990, and Census 2000 data for individual categories included a number of people who were tabulated in a “not reported” category in previous censuses.

The following publications contain information on the various factors affecting comparability and are particularly useful for understanding differences in the industry and occupation information from earlier censuses: U.S. Bureau of the Census, *Changes Between the 1950 and 1960 Occupation and Industry Classifications With Detailed Adjustments of 1950 Data to the 1960 Classifications*, Technical Paper No. 18, 1968; U.S. Bureau of the Census, *1970 Occupation and Industry Classification Systems in Terms of Their 1960 Occupation and Industry Elements*, Technical Paper

No. 26, 1972; and U.S. Bureau of the Census, *The Relationship between the 1970 and 1980 Industry and Occupation Classification Systems*, Technical Paper No. 59, 1988. For citations for earlier census years, see the 1980 Census of Population report, PC80-1-D, *Detailed Population Characteristics*.

The 1990 census introduced an additional class of worker category for “private not-for-profit” employers, which was also used for Census 2000. This category was a subset of the 1980 category “employee of private employer,” so there are no comparable data before 1990. Also in 2000, employees of foreign governments, the United Nations, etc., were classified as “private not-for-profit” rather than “federal government” as in the 1970, 1980, and 1990 censuses. While in theory there was a change in comparability, in practice, the small number of U.S. residents working for foreign governments made this change negligible.

Comparability between the statistics on industry and occupation from Census 2000 and statistics from other sources was affected by many of the factors described in the “Employment Status” section. These factors were primarily geographic differences between residence and place of work, different dates of reference, and differences in counts because of dual job holdings. Industry data from population censuses covered all industries and all kinds of workers, whereas data from establishments often excluded private household workers, government workers, and the self-employed. Also, the replies from household respondents could have differed in detail and nature from those obtained from establishments.

Occupation data from the census and data from government licensing agencies, professional associations, trade unions, etc., may not have been as comparable as expected. Organizational listings often included people not in the labor force or people devoting all or most of their time to another occupation; or the same person may have been included in two or more different listings. In addition, relatively few organizations, except for those requiring licensing, attained complete coverage of membership in a particular occupational field.

Question 30. Work Experience

30

a. LAST YEAR, 1999, did this person work at a job or business at any time?

☐ Yes

☐ No → Skip to 31

b. How many weeks did this person work in 1999?
Count paid vacation, paid sick leave, and military service.
Weeks

c. During the weeks WORKED in 1999, how many hours did this person usually work each WEEK?
Usual hours worked each WEEK

Since 1940, the census has included questions on the number of weeks worked during the preceding year. The 1980 question added an inquiry about the usual number of hours worked per week in the previous year. The Census 2000 question included this addition, but changed the wording of Question 30a. It capitalized the words “LAST YEAR”; substituted the words “at any time” for “even for a few days,” which the census had used since 1960; dropped the qualifier “paid” before “job or business”; and omitted the words “or farm.” Questions 30b and 30c were virtually identical to their 1990 counterparts.

The components of this item constituted the battery of questions on work experience. Question 30a (worked last year) instructed people who had worked during the previous year to answer the questions on weeks and hours worked. The number of weeks worked in the previous year (30b) and usual hours worked per week (30c) served, among other uses, as qualifiers for the income and earnings data (see Questions 31 and 32). Because all income-related information in the census referred to the calendar year before the census was taken (1999), the information on weeks worked and usual hours worked per week in the previous year was necessary to estimate weekly and hourly earnings and to take into account differences in weeks and hours worked when analyzing income and earnings data by various subgroups of the population, such as race and sex. If the hours worked each week varied considerably, the respondent was instructed to report an approximate average of the number of hours worked per week.

Coding. No coding was required.

Editing and allocation. The responses to Questions 30a, b, and c were edited for consistency among themselves and with the income, industry, occupation, class-of-worker, employment status, and year-last-worked items. Missing entries were allocated a value from a person with similar characteristics, in conjunction with allocation for missing entries to Items 27 to 31.

Questions 31 and 32: Income and Total Income

Question 31. Income

31 INCOME IN 1999 — Mark ☒ the "Yes" box for each income source received during 1999 and enter the total amount received during 1999 to a maximum of \$999,999. Mark ☒ the "No" box if the income source was not received. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

For income received jointly, report, if possible, the appropriate share for each person; otherwise, report the whole amount for only one person and mark ☒ the "No" box for the other person. If exact amount is not known, please give best estimate.

a. Wages, salary, commissions, bonuses, or tips from all jobs — Report amount before deductions for taxes, bonds, dues, or other items.

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00

☐ No

b. Self-employment income from own nonfarm businesses or farm businesses, including proprietorships and partnerships — Report NET income after business expenses.

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00 ☐ Loss

☐ No

31 c. Interest, dividends, net rental income, royalty income, or income from estates and trusts — Report even small amounts credited to an account.

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00 ☐ Loss

☐ No

d. Social Security or Railroad Retirement

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00

☐ No

e. Supplemental Security Income (SSI)

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00

☐ No

f. Any public assistance or welfare payments from the state or local welfare office

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00

☐ No

g. Retirement, survivor, or disability pensions — Do NOT include Social Security.

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00

☐ No

h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

☐ Yes Annual amount — Dollars
\$ | | | , | | | .00

☐ No

Question 32. Total Income

32 What was this person's total income in 1999? Add entries in questions 31a—31h; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

Annual amount — Dollars

☐ None OR \$ | | | , | | | .00 ☐ Loss

Every census since 1940 has included questions about income. The 1990 census and Census 2000 asked two questions about income, one of which had eight parts concerning eight different income categories, for a total of nine inquiries. Each category asked if the respondent had received income from a specific source in the previous year and, if so, to write in the amount from that source in the response box. Question

31 covered types of income for people 15 years and older, while Question 32 asked for total income—the sum of all the parts in Question 31.

The 2000 and 1990 questions about total income were identical. However, there were a few significant changes in the income-category question (Question 31 in Census 2000). The 2000 categories omitted a separate category for farm self-employment income, placing such income in the remaining category of self-employment income (31b). The 2000 item also separated Supplemental Security Income (SSI) from other public assistance or welfare payments. These comprised a single category (31f) in 1990 and included Aid to Families with Dependent Children (AFDC). In 2000, SSI constituted its own category (31e), and AFDC payments were dropped. “Any public assistance or welfare payments from the state or local welfare office” constituted category 31f. The remaining categories for 2000 were identical to those in the 1990 questionnaire.

One other important difference between 2000 and 1990 concerned the level of total reportable income. Census 2000 was the first census to allow more than 6 digits in total income, allowing up to \$5,299,992. Prior to Census 2000, the total was capped at \$999,999.

Part a of Question 31 (wages, salary, commissions, bonuses, or tips from all jobs) measured total money earnings received for work performed as an employee during the previous calendar year. Part b (Question 31) included net money income (gross receipts minus expenses) from one’s own business or farm business, professional enterprise, or partnership. Gross receipts included the value of all goods sold and services rendered. Expenses included such items as costs of goods purchased, rent, heat, light, power, depreciation charges, wages and salaries paid, and business taxes (not personal income taxes).

Part c measured property income. It included interest on savings or bonds, dividends from stockholdings or mutual funds, net royalties, net income from rental properties, receipts from boarders or lodgers, and periodic income from estates and trusts. Part d included social security pensions, survivors’ benefits, and permanent-disability insurance payments made by the Social Security Administration (before deductions for medical insurance) and Railroad Retirement benefit checks from the U.S. government. Medicare reimbursements were not to be included.

Part e included SSI payments made by federal or state welfare agencies to low-income people who were 65 years or older or were blind or disabled. Part f included general welfare or public assistance payments. It did not include separate payments received for hospital or other medical care (payments to vendors).

Part g (retirement, survivor, or disability pensions) first appeared in 1990 and was continued in 2000. Part h asked respondents to report periodic income not covered in the previous categories; for example, workers’ or unemployment compensation, contributions received periodically from people not living in the household, military-family allotments, net gambling winnings, veterans’ (VA) payments, alimony, or child support.

Coding. None was required for these items.

Editing and allocation. Income was a write-in entry on Census 2000 questionnaires. These write-ins were captured and converted to electronic data through the use of an automated optical character recognition (OCR) system, as were all Census 2000 write-in responses. Income ranges were established for each income item as a means of determining reasonableness. If a captured OCR value was outside of its predesignated reasonableness range, the item was referred to a keyer for manual entry.

After data capture, there was still the possibility for several types of errors in reporting income. Some of the more common types of error included misread characters, misidentification of an income source, reporting subannual amounts such as monthly or weekly values, double reporting, or not reporting income at all.

All captured income amounts went through an elaborate set of computer edits to reduce reporting errors and improve accuracy. These edits made sure reported amounts were consistent with basic demographic characteristics such as age, education, job information, and work experience. For example, if a person reported an amount as self-employment income, but was listed as a private wage and salary worker, the self-employment amount was shifted to wages and salary. Also, individual amounts were checked against a reported total value to check for missing or double-counted components.

Missing income information was allocated through the use of elaborate hot-deck matrices. This procedure allocated responses to people with missing income information by using the answers reported from people with the same demographic characteristics.

Poverty Status in 1999

The poverty data were derived from answers to long-form questionnaire Items 31 and 32, the same questions used to derive income data, and from responses to Items 1 and 2, which gave the number of people in the household and each one's relationship to the householder. The Census Bureau's poverty definition was designed to be the official *statistical* poverty measure—not an eligibility requirement for any specific program. The Social Security Administration (SSA) developed the original poverty definition in 1964, which federal interagency committees subsequently revised in 1969 and 1980. The U.S. Office of Management and Budget's Directive 14 prescribed this definition as the official poverty measure for federal agencies to use in their statistical work.

Derivation of the current poverty measure. The original poverty index provided a range of income cutoffs adjusted by such factors as family size, sex of the family head, number of children under 18 years old, and farm-nonfarm residence. At the core of this definition of poverty was the economy food plan, the least costly of four nutritionally adequate food plans designed by the U.S. Department of Agriculture. Based on the Department of Agriculture's 1955 survey of food consumption, it was determined that families of three or more persons spent approximately one-third of their income on food. The poverty level for these families was, therefore, set at three times the cost of the economy food plan. For smaller families and persons living alone, the cost of the economy food plan was multiplied by factors that were slightly higher in order to compensate for the relatively larger fixed expenses of these smaller households. Annual revisions of these SSA poverty cutoffs were based on price changes of the items in the economy food budget.

The poverty thresholds were revised annually to allow for changes in the cost of living as reflected in the Consumer Price Index. The poverty thresholds were the same for all parts of the country—they were not adjusted for regional, state, or local variations in the cost of living. For a detailed discussion of the poverty definition, see U.S. Census Bureau, Current Population Reports, Series P-60, No. 210, *Poverty in the United States: 1999*.

How the Census Bureau determined poverty status. In determining the poverty status of families and unrelated individuals in 1999, the Census Bureau used 48 thresholds (income cutoffs) arranged in a two-dimensional matrix. The matrix consisted of family size (from one person to nine or more people) cross-classified by the presence and number of family members under 18 years old (from no children present to eight or more children present). Unrelated individuals and two-person families were further differentiated by age of the reference person (under 65 years old and 65 years and older).

To determine a person's poverty status, the person's total family income was compared with the poverty threshold appropriate for that person's family size and composition (see table below). If the total income of that person's family was less than the threshold appropriate for that family, then the person was considered poor, together with every member of his or her family. If a person was not living with anyone related by birth, marriage, or adoption, then the person's own income was compared with his or her poverty threshold.

Table 3-2.

Poverty Threshold in 1999 by Size of Family and Number of Related Children Under 18 Years

[In current dollars]

Size of family unit	Related children under 18 years								
	None	One	Two	Three	Four	Five	Six	Seven	Eight or more
One person (unrelated individual)									
Under 65 years	8,667								
65 years and over.....	7,990								
Two people									
Householder under 65 years	11,156	11,483							
Householder 65 years and over	10,070	11,440							
Three people	13,032	13,410	13,423						
Four people	17,184	17,465	16,895	16,954					
Five people.....	20,723	21,024	20,380	19,882	19,578				
Six people.....	23,835	23,930	23,436	22,964	22,261	21,845			
Seven people.....	27,425	27,596	27,006	26,595	25,828	24,934	23,953		
Eight people	30,673	30,944	30,387	29,899	29,206	28,327	27,412	27,180	
Nine people or more.....	36,897	37,076	36,583	36,169	35,489	34,554	33,708	33,499	32,208

Individuals for whom poverty status was determined. Poverty status was determined for all people except those living in institutions, those in military group quarters or college dormitories, and unrelated individuals under 15 years old. These groups also were excluded from the numerator and denominator when calculating poverty rates. They were considered neither “poor” nor “nonpoor.”

Comparability. The poverty definition used in the 1980 census and later differed slightly from the one used in the 1970 census. Three technical modifications were made to the definition used in the 1970 census:

1. Beginning with the 1980 census, the Census Bureau eliminated any distinction between thresholds for “families with a female householder with no husband present” and all other families. The new thresholds—which applied to all families regardless of the householder’s sex—were a weighted average of the old thresholds.
2. The Census Bureau eliminated any differences between farm families and nonfarm families, and between farm and nonfarm unrelated individuals. In the 1970 census, the farm thresholds were 85 percent of those for nonfarm families, whereas in 1980 and later, the same thresholds were applied to all families and unrelated individuals regardless of residence.
3. The thresholds by size of family were extended from seven or more people in 1970 to nine or more people in 1980 and later.

These changes resulted in a minimal increase in the number of poor at the national level. For a complete discussion of these modifications and their impact, see U.S. Census Bureau, Current Population Reports, Series P-60, No. 133, *Characteristics of the Population Below the Poverty Level: 1980*.

With respect to poverty, the population covered in the 1970 census was almost the same as that covered in the 1980 census and later. The only difference was that in 1980 and after, unrelated individuals under 15 years old were excluded from the poverty universe, while in 1970, only those under age 14 were excluded. The limited poverty data from the 1960 census excluded all people in group quarters and included all unrelated individuals regardless of age. It was unlikely that these differences in population coverage would have had significant impact when comparing the poverty data for people since the 1960 census.

100 Percent Housing Question

Vacancy Status

This item, classifying vacant units in 2000, was first used in 1940. The 1960 form added a separate category for units held for migratory workers. This category was combined with the 1970 “seasonal” item and with the 1980 “held for occasional use” category. The 1980 term “year-round, occasional use” was combined with “seasonal/migratory” and became “for seas/rec/occ” (for seasonal, recreational, and occasional use) in 1990. For Census 2000, this item was present only on the enumerator forms (D-1E and D-2E).

In the “Interview Summary” section of the questionnaire, the enumerator marked the box for “vacancy status” for every questionnaire for which he or she entered “vacant, regular” or “vacant, usual home elsewhere” in Item A. The enumerator reported the status of the vacant unit as of Census Day in Item C by asking a reliable respondent, such as a rental agent, building manager, or neighbor. Vacant units offered for rent *or* for sale were classified as “for rent,” while the “for sale only” units were limited to those lacking a rental option.

Enumerators were to enter “Rented or sold, not occupied” if any money had been paid or agreed upon but the new owner or renter had not yet moved into the unit.

“For seasonal, recreational, or occasional use” included the following types of vacant units: those intended for occupancy during only certain seasons of the year, such as beach cottages, hunting and ski cabins, etc.; those for weekend or other occasional use throughout the year; shared-ownership or time-sharing condominiums; and those held for herders, loggers, fish packers, and other workers not employed in farm work.

“For migrant workers” included vacant units intended for migratory workers employed in farm work during the crop season. (Work in a cannery, freezer plant, or seed-processing plant was *not* considered to be farm work.)

“Other vacant” included unoccupied units not falling into any of the above categories, such as those held for (1) settlement or an estate, (2) occupancy by a caretaker or janitor, or (3) personal reasons of the owner or renter.

Editing and allocation. The computer compared Item C (vacancy status) with Questions 46 (contract rent) and 51 (value). For “vacant-regular units,” any entry in C was accepted if both Questions 46a and 51 were blank. Where C and 46a showed no entry but a response was indicated for Question 51, C was edited to “for sale only.” Where C and Question 51 were blank but a response was indicated for Question 46a, C was edited to “for rent.” Where all three items were blank, C was allocated from a preceding vacant unit. For “vacant-usual home elsewhere units,” any entry in C was accepted; blank C was edited to “for seas/rec/occ.” For occupied units, blank C was accepted; any entries made for C were blanked.

Question 33. Tenure

- 33** Is this house, apartment, or mobile home —
- ☐ Owned by you or someone in this household with a mortgage or loan?
 - ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
 - ☐ Rented for cash rent?
 - ☐ Occupied without payment of cash rent?

Data from this question provided the count of owner- and renter-occupied units basic to most housing tabulations and analyses. The responses revealed the extent to which the U.S. population attained the goal of widespread home ownership and the degree of geographic, ethnic, and racial variation in owner- and renter-occupied units.

The 2000 tenure question was essentially the same as the 1990 question, except the 2000 question added “mobile home” to “house” and “apartment” as a type of dwelling. Tenure was the only housing characteristic in Census 2000 that was collected for all occupied housing units. The previous census (1990) had included seven housing questions that were asked of the residents of all occupied housing units.

In 1890, 1900, and 1910, census enumerators asked all respondents about home or farm ownership, liens, mortgages, and rentals. The 1920 and 1930 censuses asked similar questions but dropped the reference to farm ownership. Until 1940 these few items about home ownership were

included among the other population data that enumerators collected. However, on August 11, 1939, following several years of severe economic depression, Congress approved a separate, greatly expanded housing census. The 1940 census, therefore, was the first to collect data on occupied and unoccupied dwellings separate from population data. All subsequent demographic censuses have included a separate housing inquiry that contained items about tenure. National legislation concerning community development block grants, mortgage revenue bonds, and housing assistance programs required information on tenure.

Coding. None was required for these items.

Editing and allocation. On the 100 percent form, any entry in tenure was accepted. If blank, tenure was allocated from a preceding occupied unit.

For sample questionnaires, tenure was compared with contract rent, value, and mortgage questions to ensure that the data were consistent; for example, when a unit had a tenure of “owned without a mortgage” and it had several entries for mortgage data, the computer software would change tenure to “owned with a mortgage.” When tenure was blank, the computer program compared responses to this question with those of contract rent, value, and mortgage. If tenure was “owned without a mortgage” and “mobile home installment loan” (Question 53a) was checked and an entry was made in “mobile home loan,” (Question 53b) tenure was changed to “owned with a mortgage.” Vacant units were not in the universe covered by the tenure question.

Sample Housing Questions

Question 34. Units in Structure

- 34 Which best describes this building?** *Include all apartments, flats, etc., even if vacant.*
- ☐ A mobile home
 - ☐ A one-family house detached from any other house
 - ☐ A one-family house attached to one or more houses
 - ☐ A building with 2 apartments
 - ☐ A building with 3 or 4 apartments
 - ☐ A building with 5 to 9 apartments
 - ☐ A building with 10 to 19 apartments
 - ☐ A building with 20 to 49 apartments
 - ☐ A building with 50 or more apartments
 - ☐ Boat, RV, van, etc.

Data from this item provided a physical description of the national housing inventory and were used extensively in cross-classification and analysis. Legislation concerning low-income home energy assistance required the use of units-in-structure (type of dwelling) data.

The 1940 census was the first to include an item describing the type of dwelling. Every subsequent census has contained this inquiry. The 1980, 1990, and 2000 questions were nearly identical. The 1980 item offered a “boat, tent, van, etc.” option, which the 1990 item referred

to simply as “other.” Additionally, the 1990 question substituted the word “apartments” for “family.” The 2000 question retained this substitution, but replaced the 1990 “other” category with a choice (“boat, RV, van, etc.”) similar to 1980’s “boat, tent, van, etc.” The 2000 item also eliminated “trailer” from “a mobile home or trailer,” leaving “a mobile home” as the response option.

Editing and allocation. In the regular computer edit, any response was accepted. Blanks were allocated from a preceding unit, with the exception of vacants, which were allocated from the preceding unit that was not a boat, RV, van, etc.

Question 35. Year Built

- 35 About when was this building first built?**
- ☐ 1999 or 2000
 - ☐ 1995 to 1998
 - ☐ 1990 to 1994
 - ☐ 1980 to 1989
 - ☐ 1970 to 1979
 - ☐ 1960 to 1969
 - ☐ 1950 to 1959
 - ☐ 1940 to 1949
 - ☐ 1939 or earlier

This item provided data on the age of the nation’s housing stock. Such information was useful in identifying areas of growth as well as areas needing rehabilitation or renewal. Safety programs, such as those assessing the hazards of lead paint exposure, also used these data. Federal legislation concerning energy policy, home mortgages, community development block grants, public housing, housing discrimination, and homeowners’ insurance required the use of “year built” information.

Every census since 1940 has included this item, though the range of years presented as answer options has shifted accordingly with each successive census. The 2000 item eliminated a “don’t know” answer option that had been presented for the first time in 1990, thus requiring respondents to choose from one of the specified date ranges.

Editing and allocation. Occupied and vacant units were considered in separate computer edits. For occupied units, Question 35 was compared with Question 36 (year householder moved into unit). In general, entries for Question 35 were accepted as long as the unit was not reported as being built after the householder moved in. Blanks were allocated from a preceding unit with similar tenure and time of householder’s moving in. For vacant units, entries were accepted, and blanks were allocated from previous units with similar structure type and vacancy status.

Question 36. Year Householder Moved In

36 When did this person move into this house, apartment, or mobile home?

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1969 or earlier

Data from this question provided measures of population transience and community stability that were useful to a number of planning and relief agencies as well as to policy makers in several fields. For example, local agencies were able to track the migration of elderly or minority people, and emergency management agencies gauged population displacement caused by hurricanes or other natural disasters. In other areas of national concern, such as establishing fair market rents and administering housing voucher allocation programs,

governing legislation required the use of “year moved in” information.

Every census since 1960 has included this item, although the 1960 and 1970 censuses placed it among the population questions rather than in the housing portion of the questionnaire. In those censuses, it was asked of all respondents. Beginning in 1980 the census shifted this item to the housing section. The 2000 item resembled the 1980 and 1990 items, except that the year ranges in the answer options shifted accordingly, and the 2000 question also included mobile homes as well as the housing options of “house or apartment” that had been presented since 1960.

Editing and allocation. The computer program compared entries for Question 4 (age of the householder) for consistency. For occupied units, where a householder’s age was less than 20 years and the response to Question 36 fell into the 1980 through 2000 categories, that response was accepted; where the answer to 36 was earlier than 1980, that answer was not accepted, and a new response was allocated from a preceding unit with similar age and tenure. Any entry for a householder 20 to 29 years old with a move-in date from 1970 or later was accepted; any combination before 1960 was allocated from a preceding unit. Any response to Question 36 for a householder 30 years and older was accepted; blanks were allocated from a preceding unit with similar age and tenure. Vacant units were not part of the universe for this question. Blank responses to Question 36 were accepted; any entries made were blanked.

Question 37. Number of Rooms

37 How many rooms do you have in this house, apartment, or mobile home? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

- | | |
|----------------------------------|--|
| <input type="checkbox"/> 1 room | <input type="checkbox"/> 6 rooms |
| <input type="checkbox"/> 2 rooms | <input type="checkbox"/> 7 rooms |
| <input type="checkbox"/> 3 rooms | <input type="checkbox"/> 8 rooms |
| <input type="checkbox"/> 4 rooms | <input type="checkbox"/> 9 or more rooms |
| <input type="checkbox"/> 5 rooms | |

Every census since 1940 has collected data on the number of rooms in a housing unit. In combination with information about the number of people residing in the unit, this item allowed for living space estimates and for calculations of the number of people per room in a particular dwelling. Such data were useful to housing policy makers and planners and were required or mandated by federal legislation concerning community development block grants, housing voucher allocations, and other housing grant programs.

The 2000 question was similar to the corresponding question in the prior three censuses. “Mobile home” was added to the “house or apartment” wording of the 1980 and 1990 censuses, which had differed from the “living quarters” wording of the 1970 item.

Editing and allocation. See Question 38 (number of bedrooms) for a description of the joint edit and allocation for rooms and bedrooms.

Question 38. Number of Bedrooms

- 38** How many bedrooms do you have; that is, how many bedrooms would you list if this house, apartment, or mobile home were on the market for sale or rent?
- ☐ No bedroom
 - ☐ 1 bedroom
 - ☐ 2 bedrooms
 - ☐ 3 bedrooms
 - ☐ 4 bedrooms
 - ☐ 5 or more bedrooms

Every census since 1960 has included an item on the number of bedrooms in a housing unit. The 1960, 1970, and 1980 questions asked respondents to count “rooms used mainly for sleeping even if used for other purposes.” The 1990 Question used a different definition, asking respondents, “How many bedrooms would you list if this house or apartment were on the market for sale or rent?” (“Or mobile home” was added in 2000.) Answer options ranged from “no bedroom” to “5 or more.” This information provided measures of household size and cost; also, in combination with other data, such as number of people per household, it offered a means of assessing housing adequacy and crowding. Legislation concerning low-income housing tax credits and housing vouchers required information on number of bedrooms per housing unit.

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Editing and allocation. The computer program compared the entries for Questions 38 and 37 (rooms) for consistency. In general, the unit had to have at least one more room in total than the number of bedrooms, and any unit with three or more rooms was expected to have at least one bedroom. Data for blanks or unacceptable entries in Questions 37 and/or 38 were allocated from preceding units with the same number of rooms and type of structure.

Question 39. Complete Plumbing Facilities

- 39** Do you have COMPLETE plumbing facilities in this house, apartment, or mobile home; that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?
- ☐ Yes, have all three facilities
 - ☐ No

Prior to 1980, the census had inquired about plumbing facilities such as flush toilets and piped water as separate items. The 1980, 1990, and 2000 items combined these facilities as a single item. The 1980 question allowed for two possible “yes” answers, one for one’s own household and one for another household if it also was using the plumbing facilities; also, the question allowed two “no” answers,

one of which covered the situation of having some but not all three plumbing facilities in the household.

This question provided data crucial for assessing the quality of housing. Such data were also useful in programs involving public health, contaminated ground water, and seniors’ eligibility for housing repair and other services. Legislation covering housing voucher allocations and other assistance programs required the use of information on plumbing facilities.

Editing and allocation. Any response to Question 39 was accepted; blanks were allocated from a preceding unit with the same units-in-structure and tenure pattern.

Question 40. Complete Kitchen Facilities

- 40** Do you have COMPLETE kitchen facilities in this house, apartment, or mobile home; that is, 1) a sink with piped water, 2) a range or stove, and 3) a refrigerator?
- ☐ Yes, have all three facilities
 - ☐ No

As with the question on plumbing facilities, the question on kitchen facilities was used in combination with other information to assess the quality of housing. Such information was widely used in housing and other assistance programs, like Meals on Wheels, and was required by legislation covering the Housing Voucher Allocation Program. The 1940 census first inquired about kitchen facilities with questions about

water supply and type of refrigeration (“mechanical,” “ice,” “other,” or “none”). The 1950 census added choices for electrical or gas refrigeration and also an item on the kitchen sink (“shared,” “exclusive use,” or “none”). The next census, in 1960, inquired whether a household had a home food freezer separate from the refrigerator.

The 1970 housing census reflected the continuing diffusion of home technologies as well as the popular perception that a rising economic tide in the 1960s had “lifted all boats.” Some items in 1970 (not part of the kitchen facilities question) covered dishwashers, battery-operated radios, and UHF (ultra-high frequency) television reception. The 1970 census first combined the three facilities (a sink with piped water, a range or stove, and a refrigerator) in a single question, and subsequent censuses have retained that format.

Editing and allocation. Any response to Question 40 was accepted, and blanks were allocated from a preceding unit with the same units-in-structure and tenure pattern.

Question 41. Telephone Service in Housing Unit

- 41** Is there telephone service available in this house, apartment, or mobile home from which you can both make and receive calls?
- ☐ Yes
- ☐ No

The primary interest in this question was assessing access to telephone communications by low-income groups and the elderly. Lack of telephone service was an indicator of poverty and of social isolation. The Communications Act of 1934 required the use of this information. Telecommunications and marketing firms also used it. Censuses from 1980 on

also asked for respondents’ telephone numbers in another section of the questionnaire in case census enumerators or other personnel needed to call for clarification of particular answers.

Inquiries about telephone use have tried to take into account varying patterns of telephone possession and use, as well as changes in phone technology. The 1960 census first asked about telephone access only, wording its inquiry, “Is there a telephone on which people who live here can be called?” The 1970 census adopted essentially the same wording, which assessed telephone availability but not necessarily telephone possession. For example, household members may have had no phone but might have used a nearby pay phone, or a neighbor’s phone, on a regular basis, even to receive calls. Conversely, the 1980 and 1990 questions asked, “Do you have a telephone in your living quarters?” (“house or apartment” in 1990) assessing telephone possession without asking whether the phone worked.

The 2000 question clarified previous ambiguities by asking, “Is there telephone service available in this house, apartment, or mobile home from which you can both make and receive calls?” If the household possessed a landline phone, it would have to be operative for this question to be answered “yes.” On the other hand, if the respondent used only a cell phone, no landline connection would be required for a “yes” answer to this question, and phone service would not depend on telephone hardware permanently located in the household. However, no instruction booklet that explained the meaning of telephone service was available to respondents in 2000. The data suggest that some respondents who relied on cell phones alone indicated that their houses, apartments, or mobile homes did not have telephone service.

Editing and allocation. For occupied units, the computer accepted any response to Question 41; blanks were allocated from a preceding occupied unit. Vacant units were not in the universe for this question.

Question 42. Fuel Used Most for House Heating

- 42** Which FUEL is used MOST for heating this house, apartment, or mobile home?
- ☐ Gas: from underground pipes serving the neighborhood
- ☐ Gas: bottled, tank, or LP
- ☐ Electricity
- ☐ Fuel oil, kerosene, etc.
- ☐ Coal or coke
- ☐ Wood
- ☐ Solar energy
- ☐ Other fuel
- ☐ No fuel used

Data about household fuel use were helpful in evaluating energy needs and forecasting energy use. Fuel type also provided a safety and quality-of-life measure since equipment used with certain fuels may have presented specific risks. Legislation concerning energy policy and low-income energy assistance required the use of house heating-fuel information.

The 1940 and 1950 censuses asked two separate questions about the principal fuel used for heating and cooking. The 1960, 1970, and 1980 censuses

asked these questions and added one about the fuel most used for heating water. The 1990 and 2000 questions asked only about the fuel used most for heating the house or apartment (or mobile home, in 2000), omitting the items about fuel used for heating water and cooking. Additionally, these last two censuses included “solar energy” as an answer option. In 1980, 1990, and 2000, separate questions about the cost of electricity, gas, oil, coal, kerosene, wood, and other fuels provided an indirect measure of household fuel consumption.

Editing and allocation. For occupied units, any response to Question 42 was accepted, and blanks were allocated from a preceding unit with the same units-in-structure and tenure pattern. Vacant units were not in the universe for Question 42.

Question 43. Vehicles Available

43 How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

☐ None

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6 or more

Information about the number of passenger cars, vans, and trucks available per household was useful in developing transportation policies and in planning future transportation needs. Such information became even more important as more regions experienced major traffic congestion and air pollution problems. Legislation concerning federal highway funds, mass transit grants, air quality, and metropolitan planning required the use of data on vehicles available per household.

The 1960 census first asked about passenger automobiles “owned or regularly used” by people in a household, with answer options from “none” up to “three or more” cars. The 1970 census asked an essentially identical question, including the instruction from 1960 to count any company cars kept at home. The 1980 census changed the wording of the question from automobiles “owned or regularly used” to “kept at home for use” and omitted the instruction to count company cars kept at home. This census also added a question about the number of “vans or trucks of one-ton capacity or less” kept at home for use by members of the household, but in both questions—about cars and about vans or trucks—the answer options of the previous censuses were retained (“none” to “three or more”).

The 1990 and 2000 questions combined the vehicle types into one question and expanded the answer options from “none” to “7 or more” in 1990 and from “none” to “6 or more” in 2000. The question wording in both censuses was otherwise identical.

Editing and allocation. For occupied units, any response to Question 43 was accepted, and blanks were allocated from a preceding unit with the same units-in-structure and tenure pattern. Vacant units were not in the universe for Question 43.

Question 44. Value Screener and Farm Residence

44 Answer ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME — All others skip to 45.

a. Is there a business (such as a store or barber shop) or a medical office on this property?

- ☐ Yes
☐ No

b. How many acres is this house or mobile home on?

- ☐ Less than 1 acre → Skip to 45
☐ 1 to 9.9 acres
☐ 10 or more acres

c. In 1999, what were the actual sales of all agricultural products from this property?

- | | |
|---|---|
| <input type="checkbox"/> None | <input type="checkbox"/> \$2,500 to \$4,999 |
| <input type="checkbox"/> \$1 to \$999 | <input type="checkbox"/> \$5,000 to \$9,999 |
| <input type="checkbox"/> \$1,000 to \$2,499 | <input type="checkbox"/> \$10,000 or more |

The census gathered data on the monetary value of the nation's one-family housing properties, screening for possible distorting factors such as the presence of a business or a medical office on the property. The census also separated one-family, nonfarm housing properties from one-family houses on farms (income-producing) and, since 1980, inquired about total agricultural sales from such properties. Legislation like the Smith-Lever Act and the Fair Housing Act required the use of data on property values and farm residences.

The 1940 housing census was the first to screen for a business in the housing unit. The 1950 census added an item about acreage. The 1970 census screened for single-family properties on 10 acres or more, as well as for the presence of a “commercial

establishment or medical office.” The 1980 census asked two questions about properties on 10 acres or more: one (Question H10a and b) in connection with a commercial establishment or a medical office and another (H15a and b) in reference to total agricultural sales from the property during the previous year. This was the first census to inquire about such sales from a residential property. Item H15a in 1980 also included for the first time an inquiry about acreage between 1 and 10 acres.

The 1990 census and Census 2000 also inquired about residential property acreage, the presence of a business or a medical office on the property, and total agricultural income during the previous year. Some wording differed from prior censuses. For example, “business (such as a store or barber shop)” was used instead of “commercial establishment.” However, the 1990 census, like the 1980 census, asked two separate, two-part questions about acreage, one in connection to a business or medical office and another in connection to total agricultural sales.

The 2000 inquiry combined these items in a three-part question about a business or medical office (44a), acreage (44b), and total agricultural sales (44c). Additionally, mobile homes and one-family homes were both included in the question, whereas prior censuses had screened out mobile homes and trailers. These data, in combination with data about estimated property value (Question 51), afforded an accurate assessment of the value of the nation's one-family housing stock, as well as the number of smaller farms usually referred to as “family farms.”

Editing and allocation. The edit program compared all three parts of this with the response to Question 34 (units in structure). For sample questionnaires, Question 44b (acreage) was also compared with 44c (farm residence). In the regular edit for Questions 44a (commercial establishment), b, and c, any entry was accepted if Question 34 was a mobile home or a one-family house; for nonresponse, Questions 44a, b, and c were allocated from a preceding unit.

Question 45. Costs of Utilities and Fuels³²

45 What are the annual costs of utilities and fuels for this house, apartment, or mobile home? *If you have lived here less than 1 year, estimate the annual cost.*

a. Electricity
Annual cost — Dollars
\$ | | | | .00
OR
☐ Included in rent or in condominium fee
☐ No charge or electricity not used

b. Gas
Annual cost — Dollars
\$ | | | | .00
OR
☐ Included in rent or in condominium fee
☐ No charge or gas not used

c. Water and sewer
Annual cost — Dollars
\$ | | | | .00
OR
☐ Included in rent or in condominium fee
☐ No charge

d. Oil, coal, kerosene, wood, etc.
Annual cost — Dollars
\$ | | | | .00
OR
☐ Included in rent or in condominium fee
☐ No charge or these fuels not used

Utility and fuel costs are important components of overall shelter costs for both homeowners and renters. From 1940 (when data on fuel and utility costs were first collected) through 1970, the census asked only renters about these expenditures. The 1980 census included homeowners as well, inquiring about “the costs of utilities and fuels for your living quarters.” The answer options preserved the distinction between renters and homeowners by including the choice, “included in rent or no charge,” following the inquiry about electricity, gas, water, and other fuels (oil, coal, kerosene, wood, etc.). As in 1990, the 2000 item instructed people who had occupied the house, apartment, or mobile home for less than a year to estimate the annual utility and fuel costs.

Editing and allocation. For occupied units, if the first part (which asked about amount) of each component indicated a response, but the second part (which asked about inclusion) did not, the amount was compared with the upper limit (e.g., the upper limit for electricity and gas was \$7,500; for oil, coal, etc., it was \$7,000; and for water, \$5,000). Any amount within the limits was accepted; any amount outside the limits was blanked and a value allocated from a preceding unit, by units in structure and (excluding Item 45c) fuel type. If both amount and inclusion entries

were made, the inclusion section was blanked. Where no amount was noted and either inclusion in rent or no charge for the utility was shown, that response was accepted. If neither an amount nor an exclusion was specified, both were allocated from a preceding unit, by units in structure and (excluding Question 45c) fuel type.

Table 3-3.
Upper Range Limits for Questions 46a, 47b, 48b, 49, 50, 52, and 53b

Question	Amount (in dollars)
46a. Contract rent	4,000
47b. Mortgage payment	11,000
48b. Second mortgage payment	11,000
49. Real estate taxes	22,500
50. Insurance	6,000
52. Condominium fee	1,750
53b. Mobile home cost	20,000

³² This question (utilities and fuel costs), together with Questions 47 (mortgage costs), 48 (second mortgage and home equity loans), 49 (real estate taxes), 50 (fire, hazard, and flood insurance), 52 (condominium fee), and 53 (mobile home costs), constitutes a category of items called “selected monthly owner costs.” Combining these items with income creates a new category, “selected monthly owner costs as a percentage of household income,” that can be used to measure housing affordability and excessive shelter costs. The concept of selected monthly owner costs applied only to owner-occupied units. The equivalent concept for renters was gross rent. Legislation covering areas such as low-income home energy assistance, low-income housing tax credits, and housing voucher allocations requires the use of monthly shelter cost data.

Question 46. Monthly Rent, Meals Included in Rent

46 Answer ONLY if you PAY RENT for this house, apartment, or mobile home — All others skip to 47.

a. What is the monthly rent?

Monthly amount — Dollars

\$ | | | | .00

b. Does the monthly rent include any meals?

☐ Yes

☐ No

The census defined monthly rent as contract rent, that is, the amount agreed to or contracted for, regardless of any furnishings, utilities, or services that may have been included in the rent. Every census since 1940 has included an inquiry about specific contract rent, though in 1960 the census collected these data from large cities only and from a 25 percent sample elsewhere. In 1960, enumerators wrote in a monthly rental amount that was later coded. In 1970, respondents wrote in a monthly rental figure then filled in a circle corre-

sponding to 1 of 14 dollar amount options ranging from “less than \$30” to “\$300 or more.” The 1980 census omitted writing in a figure and expanded the number of monthly amount range options to 24 (from “less than \$50” to “\$500 or more”). The 1990 census offered 26 such options (from “less than \$80” to “\$1,000 or more”) and added a new item inquiring whether the monthly rent included meals. This item applied to “congregate housing,” or units with meal plans included in the rent.

Census 2000 continued the inquiry about meals, but eliminated the numerous options for ranges of monthly rental amounts and returned to the use of a write-in rental figure for “this house, apartment, or mobile home.” Legislation concerning housing voucher allocations and fair market rents required the use of information on monthly rents.

Editing and allocation. The computer compared responses to Question 46a with those to Question 33 (tenure) and, on the enumerator form, Item C (vacancy status). Residents of owner-occupied units were not required to answer Question 46. For both renter-occupied and vacant-for-rent units where the Question 33 entry was any response other than “occupied without payment of cash rent,” any response to Question 46a was accepted unless its value was less than the monthly income or it was above the upper range limit. When there was no response, Question 46a was allocated from a preceding unit with the same units-in-structure pattern, renter tenure for occupied units, and vacant-for-rent status for vacant units.

For renter-occupied units paying cash rent and vacant-for-rent units, any response to Question 46b was accepted. Owner-occupied units, no-cash rental units, and vacant units not for rent weren’t in the universe for Question 46b.

Question 47. Mortgage Status, Monthly Payment, Taxes, and Insurance Included in Monthly Mortgage Payment

47 Answer questions 47a–53 if you or someone in this household owns or is buying this house, apartment, or mobile home; otherwise, skip to questions for Person 2.

a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?

☐ Yes, mortgage, deed of trust, or similar debt

☐ Yes, contract to purchase

☐ No → Skip to 48a

b. How much is your regular monthly mortgage payment on THIS property? *Include payment only on first mortgage or contract to purchase.*

Monthly amount — Dollars

\$ | | | | .00

OR

☐ No regular payment required → Skip to 48a

c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?

☐ Yes, taxes included in mortgage payment

☐ No, taxes paid separately or taxes not required

d. Does your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

☐ Yes, insurance included in mortgage payment

☐ No, insurance paid separately or no insurance

The 1890 census first included an item about mortgages, asking whether a home was “free from mortgage encumbrance.” Every subsequent census inquired about mortgage status. The 1940 census also asked about the existence of second mortgages and for the specific dollar value(s) of the mortgage(s). In 1950 the census asked for the existence of “any mortgage (or trust)” but did not ask for the dollar amount.

The 1980 census asked a five-part mortgage-status question. The first part concerned the existence of a “mortgage, deed of trust, contract to purchase, or similar debt on *this* property?” The second asked about any “second or junior mortgage”; the third, about the total amount of all monthly mortgage payments; the fourth, about whether that amount included real estate taxes; and the fifth part asked whether the amount included fire and hazard insurance premiums. The instructions for this question in 1980 excluded condominiums and mobile homes; these were included in the instructions for 1990. The 1990 question (H23a–d) consisted of four, not five, parts because the item on second or junior mortgages was asked as a separate question

(see below). This required modification of the wording in Item H32c (1980) asking for the total amount of all monthly mortgage payments, such that the corresponding item in 1990 (H23b) asked only for the “regular monthly mortgage payment.” Additionally, 1990 Item H23d added flood insurance premiums to fire and hazard insurance payments. The 2000 question was identical to the 1990 question, except for the preliminary instruction that included mobile homes.

Editing and allocation. The answer to Question 47a (mortgage status) was accepted if the answer was “no” (not mortgaged) and there were no amounts for first mortgage payment (47b) or second mortgage payment (48b), even if the response to Question 53a (mobile home installment loan) was “yes.” The answer was also accepted if it was “yes, mortgage, deed of trust, or similar debt” and there was an amount or no regular payment answered in either of the mortgage payment questions (47b or 48b).

If the response to Question 47a was blank or “no” and there was an amount in mortgage payment (47b or 48b), Question 47a was edited to “yes, mortgage, deed of trust, or similar debt.”

If Question 47a was answered “yes, mortgage, deed of trust, or similar debt,” but 47b was blank or above the upper range limit (see the table preceding Question 46), the mortgage payment (47b) was allocated from the preceding mortgaged owner-occupied unit by unit type and value.

A similar procedure for mortgaged units was used to edit and allocate Questions 47c, inclusion of real estate taxes in mortgage payment, and 47d, inclusion of insurance in mortgage payment.

In all other mortgaged-unit cases, the computer edited and allocated the responses to Questions 47a through 47d in conjunction with the second mortgage items (48a and b) and 53a and b (mobile home installment loan and mobile home cost). This was done because of the close relationship between these items when a property was mortgaged. In these cases, all items were allocated from a preceding mortgaged owner-occupied unit by unit type and value.

Question 48. Second Mortgage, Home Equity Loan

48 a. You have a second mortgage or a home equity loan on **THIS** property? Mark ☒ all boxes that apply.

☐ Yes, a second mortgage

☐ Yes, a home equity loan

☐ No → Skip to 49

b. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on **THIS property?**

Monthly amount — Dollars

\$.	00
----	--	--	--	--	--	---	----

OR

☐ No regular payment required

Starting in 1990, this item was asked separately from the question on primary mortgage, in recognition of the increasing popularity of home equity loans as a means of financing such expenditures as home improvements and college tuition. The 2000 question (Part a) omitted the reference to “junior mortgage” and asked respondents to specify the type of loan by checking “yes” if they had a second mortgage; “yes” if they had a home equity loan; or “no” if they had neither. The previous census had grouped both forms of loans together and asked only if respondents had either of them, or none. Part b of the 2000 question, asking about total loan amounts, was identical to Part b of the 1990 question, including the reference to “junior mortgages” that Part a of the 2000 questionnaire had dropped.

Editing and allocation. In most circumstances, Questions 48a and 48b were edited and allocated in conjunction with the mortgage items (Questions 47a through d). See “Editing and allocation” under Question 47 for the procedures covering these situations.

If Question 48b (second mortgage payment) was blank or above the upper range limit (see the table preceding Question 46), the second mortgage payment was allocated from the preceding mortgaged owner-occupied unit by unit type and value.

Question 49. Real Estate Taxes

49 What were the real estate taxes on THIS property last year?

Yearly amount — *Dollars*

\$, .00

OR

☐ None

The 1980 census was the first to ask for the amount of real estate taxes paid on the respondent's household property. The wording of the question and the answer options remained unchanged in the corresponding 1990 census and Census 2000 questions. However, in 1990 the preliminary instructions included mobile homes and condominiums, which the 1980 question had specifically excluded. Preliminary

instructions for the 2000 question also included mobile homes, but used the word “apartment” instead of “condominium.”

Editing and allocation. See Question 51 (value of property) for a discussion of the joint edit and allocation of real estate taxes and property value.

Question 50. Fire, Hazard, and Flood Insurance

50 What was the annual payment for fire, hazard, and flood insurance on THIS property?

Annual amount — *Dollars*

\$ | | | , | | | .00

OR

☐ None

The 1980 census was the first to ask about the “annual premium for fire and hazard insurance on THIS property.” The corresponding questions in the 1990 census and Census 2000 changed the word “premium” to “payment” and used all-capitals instead of underscoring to emphasize “THIS property.” The 2000 write-in answer referred to “annual” rather than “yearly” amount, as in 1990, but in every other respect the 1990 and 2000 questions were identical.

Editing and allocation. For owner-occupied units with an amount in Question 50, this amount was verified with the upper range limit (see the table preceding Question 46), and accepted if within those limits. If outside those limits, or if Question 50 was blank, a value was allocated from the preceding owner-occupied unit by unit type and value.

Question 51. Value of Property

51 What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?

- | | |
|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$90,000 to \$99,999 |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$100,000 to \$124,999 |
| <input type="checkbox"/> \$15,000 to \$19,999 | <input type="checkbox"/> \$125,000 to \$149,999 |
| <input type="checkbox"/> \$20,000 to \$24,999 | <input type="checkbox"/> \$150,000 to \$174,999 |
| <input type="checkbox"/> \$25,000 to \$29,999 | <input type="checkbox"/> \$175,000 to \$199,999 |
| <input type="checkbox"/> \$30,000 to \$34,999 | <input type="checkbox"/> \$200,000 to \$249,999 |
| <input type="checkbox"/> \$35,000 to \$39,999 | <input type="checkbox"/> \$250,000 to \$299,999 |
| <input type="checkbox"/> \$40,000 to \$49,999 | <input type="checkbox"/> \$300,000 to \$399,999 |
| <input type="checkbox"/> \$50,000 to \$59,999 | <input type="checkbox"/> \$400,000 to \$499,999 |
| <input type="checkbox"/> \$60,000 to \$69,999 | <input type="checkbox"/> \$500,000 to \$749,999 |
| <input type="checkbox"/> \$70,000 to \$79,999 | <input type="checkbox"/> \$750,000 to \$999,999 |
| <input type="checkbox"/> \$80,000 to \$89,999 | <input type="checkbox"/> \$1,000,000 or more |

Inquiries about property value first appeared in 1890 on a supplementary schedule for mortgaged farms and homes. Questions included the market value of the farms or homes and whether they were mortgaged. Censuses in 1920, 1930, 1940, and 1950 made similar inquiries, though the 1950 item included a clarification for respondents that “value” meant what the property “would sell for” if it were for sale. Subsequent censuses adopted this same definition in instructions to respondents. In the 1960 census, ten value categories ranging from “less than \$5,000” to “\$35,000 or more” replaced the earlier write-in entries. The question was asked on a 100 percent basis in large cities and on a 25 percent basis elsewhere. The 1970 census made the

home property value question a 100 percent item (asked of all respondents in all areas) and presented 11 value categories ranging from “less than \$5,000” to “\$50,000 or more.”

The 1980 and 1990 census also asked this question of all respondents and specified that condominium units were to be included as home properties. The 1980 question presented 24 value categories ranging from “less than \$10,000” to “\$200,000 or more,” whereas the 1990 question presented 26 categories from “less than \$10,000” to “\$500,000 or more.” The 2000 question was asked on a sample basis. It presented 24 value categories with the same floor but a higher ceiling, at “\$1,000,000 or more,” reflecting the continuing appreciation in housing prices during the latter decades of the century. The 2000 item also specified the inclusion of “mobile home and lot,” and substituted the word “apartment” for “condominium” in the instructions.

Editing and allocation. Value of property and real estate taxes were edited jointly in 2000. The edit was based on the correlation between the two based on Questions 34 (units in structure) and 44b (size of lot/number of acres). The tax rate was computed in percentile distributions for each state. For owned units and vacant-for-sale units, value and/or taxes, if missing, were assigned according to the tax rate in that state. Vacant-for-sale units, renter-occupied units, and vacant units other than those for sale were not in the universe for property value or for real estate tax.

Question 52. Monthly Condominium Fee

52 Answer ONLY if this is a CONDOMINIUM — What is the monthly condominium fee?

Monthly amount — Dollars

\$ | | , | | .00

The 1990 census first asked condominium owners about the monthly condominium fee, preceded by the instruction, “Answer ONLY if this is a CONDOMINIUM.” Census 2000 also inquired about condominium fees, adopting the same wording and instruction as in the 1990 question. The Census 2000 item was somewhat flawed since the census

did not include a question on whether the unit was a condominium. As a result, it was not possible to check on whether the fee amount entered was actually for a condominium.

Editing and allocation. For owner-occupied units, any response to Question 52 was accepted. Renter-occupied units and vacant units were not in the universe for Question 52. Blanks were allocated from a preceding owned unit by unit type.

Question 53. Mobile Home Costs

53 Answer ONLY if this is a MOBILE HOME —

a. Do you have an installment loan or contract on THIS mobile home?

☐ Yes
☐ No

b. What was the total cost for installment loan payments, personal property taxes, site rent, registration fees, and license fees on THIS mobile home and its site last year? *Exclude real estate taxes.*

Yearly amount — Dollars

\$ | | , | | .00

Historically, mobile homes were considered personal, instead of real, property; therefore, the decennial census did not include mobile home data with housing shelter cost data. However, after several local public meetings, and in consideration of the increasing number of people living in mobile homes, the 1990 census began including mobile-home shelter costs. The 1990 question asked only for the total costs (personal property taxes, site rent, registration fees, and license fees), excluding real estate taxes. It did not mention installment loan payments as a possible component of the total costs of mobile-home shelter.

The Census 2000 item addressed this issue by asking a two-part question: first, whether the person had an installment loan or contract on the mobile home (53a), and then what the total costs were, including installment loan payments (53b).

Editing and allocation. In many circumstances where the mobile home had an installment loan, the computer program edited and allocated responses to Question 53a in conjunction with the tenure or mortgage edit (Items 33 or 47a). See “Editing and allocation” under Questions 33 and 47 for the procedures covering these situations.

In other cases, such as when the mobile home did not have a mobile home installment loan or a mortgage, Questions 53a and b were edited and allocated independent of the other shelter cost items. For owner-occupied mobile homes, an amount supplied for Question 53b was verified with the upper range limit (see table preceding Question 46), and accepted if within those limits. If above the limit or if Questions 53a or b were blank, these items were allocated from a preceding owner-occupied mobile home.

Chapter 4.

The Partnership and Marketing Program

INTRODUCTION	173
THE 1990 CENSUS OF POPULATION AND HOUSING	173
Vitt Media	173
Gilbreath Communications Inc.	174
DEVELOPING COOPERATIVE VENTURES (PARTNERSHIPS)	174
1995 Census Test	174
Working Group on Cooperative Ventures	176
Partnerships Steering Committee and Partnerships Council	176
Coordination Team for Intergovernmental Programs and Policies (CTIPP)	176
Advisory Committees	176
The Secretary of Commerce's Decennial Census Advisory Committee	176
The Census Race and Ethnic Advisory Committees	177
The Census Advisory Committee of Professional Associations	177
DIVISION OF LABOR FOR PLANNING AND IMPLEMENTATION	177
SAMPLING AND DUAL-TRACK PLANNING	178
INTEGRATED MARKETING STRATEGY	179
DECISION TO USE PAID ADVERTISING	179
Acquisition Team	180
Development of Request for Proposals	180
Selection Process	180
YOUNG & RUBICAM (Y&R)	181
Focus Groups and Market Research	181
Market Segmentation	182
The Dress Rehearsal Advertising Campaign	183
Census 2000 Dress Rehearsal Evaluation	183
CENSUS 2000 PAID ADVERTISING	185
Census 2000 Advertising Phases	185
Media Buying Strategy	185
Census 2000 Logo	186
Census 2000 Tagline	186
Cost of the Media Campaign	187
Census 2000 "Fine Arts" Posters	188
African American: <i>Family</i> , by Romare Bearden	188
Rural America: <i>School Scene</i> , by J.C. Huntington	188
Public Libraries: <i>The Library</i> , by Jacob Lawrence	189
American Indian: <i>Buffalo Dance</i> , by Allan Houser	189
Hispanic: <i>Camas Para Sueños</i> , by Carmen Lomas Garza	190
Asian: <i>Branches III</i> , by Hung Liu	190
Alaska Native: <i>Raven The Creator</i> , by John Hoover	191
Puerto Rico: <i>Plaza San José</i> , by Manuel Hernández Acevedo	191
Pacific Islander: <i>The New Quilt</i> , by Herb Kawainui Kane	192
Northern Mariana Islands: <i>Passage to the New World</i> , by Frank S. Palacios and Soo Seon Jeong	192
American Samoa: <i>Salute to the Sun—A New Beginning</i> , by Jonathon Woo	193
Guam: <i>Guam</i> , by Ariel Dimalanta	193
U.S. Virgin Islands: <i>Good Day Ladies</i> , by Leo Carty	194
DIRECT MAIL	194

CONTENTS

PROMOTIONS AND SPECIAL EVENTS	195
How America Knows What America Needs (HAKWAN)	195
Census 2000 Road Tour	195
TeamFed.	195
Census In Schools.	196
Public Service Announcements (PSAs)	196
MEDIA RELATIONS	197
Operational Press Briefings	198
Media Education	198
Media Training	198
Media Relations Results	198
COMMUNICATIONS GUIDE	199
CRISIS COMMUNICATIONS GUIDE	199
CENSUS 2000 PARTNERSHIP PROGRAM	199
History of the Outreach Program	199
Program Planning for Census 2000	200
Program Staffing and Responsibilities	200
Media Partnership Specialists	201
Types of Partners	202
Types of Partnership Activities	202
Complete Count Committees	202
Governor's Liaison Program	202
Tribal Government Liaison Program	202
Census 2000 and Congregations	202
Questionnaire Assistance Centers	203
Be Counted Program	203
Special Initiatives	203
Natural Disasters Special Initiative (Hurricane Floyd/Flooding Component)	203
Large City and State Special Initiative	203
Texas Colonias Special Initiative	204
Central and South American Special Initiative	204
Urban and Rural American Indians and Alaska Natives Special Initiative	204
Minority Colleges/Universities and Pan-Hellenic Special Initiative	204
Joint Disability Special Initiative	205
New York City Metro Transit Authority Special Initiative	205
African and Caribbean Immigrant Special Initiative	205
Joint Partnership Special Initiative on Arab Populations	205
Joint Language Diversity Partnership Special Initiative	205
Faith-Based Program Support Plan Special Initiative	205
Operation RESPOND Special Initiative	206
Support for Partners	206
In-Kind Support	206
Thank You Campaign	206
Partnership Program Results	206
Impact of the Partnership Program	207
Partnership Program Evaluations	207
Evaluation of the Census 2000 Partnership and Marketing Campaign	207
Evaluation of the Survey of Partners	207

CONTENTS

RESULTS OF THE CENSUS 2000 PARTNERSHIP AND MARKETING PROGRAM **207**

Effectiveness of the Integrated Marketing Strategy 208

InterSurvey/Census Bureau Analysis 209

Government Accountability Office's Report 209

Gallup Organization/Institute of Social Research at the University of Michigan 210

Inspector General's Report 210

Monitoring Board's Report 211

EXTERNAL RECOGNITION: AN AWARD-WINNING STRATEGY **211**

Silver Anvil Award of Excellence (Public Relations Society of America) 211

David Ogilvy Awards (Advertising Research Foundation) 211

Effie Award (American Marketing Association) 211

Telly Awards 212

CONCLUSION. **212**

Chapter 4: The Partnership and Marketing Program

INTRODUCTION

At the dawn of the twenty-first century, the U.S. Census Bureau faced its most daunting mission ever—counting the largest, most mobile and diverse population in the nation's history and halting a 20-year trend of declining participation in the census.¹ Experts estimated that the initial response rate for Census 2000 would be 61 percent, or about 73 million responses out of an estimated 120 million households. Such a response rate would require the Census Bureau to contact approximately 47 million households during the nonresponse follow-up phase—historically the most labor- and cost-intensive element of decennial census operations.²

During previous censuses, the Census Bureau relied on public service announcements to promote the census, but these announcements did not reach a broad enough audience to prove effective in raising the level of public awareness about the census.³ As a result, for Census 2000, the Census Bureau undertook an ambitious integrated marketing strategy that included paid advertising, direct mail, media relations, promotions and special events, and partnerships to educate people about the census, motivate them to return questionnaires, and encourage cooperation with enumerators.⁴

THE 1990 CENSUS OF POPULATION AND HOUSING

Following the 1990 census, the Census Bureau commissioned several studies comparing the advantages and disadvantages of paid versus pro bono advertising campaigns. The two most notable studies—by Vitt Media and Gilbreath Communications Inc.—analyzed the pro bono advertising experience of the 1990 census and made suggestions for improved awareness and response for Census 2000. Both reports strongly recommended a paid advertising campaign.

Vitt Media

Vitt Media, an independent contractor chosen to assess the campaign and offer improvements following the 1990 census, found several developments that prompted the Census Bureau to reevaluate its advertising and promotion campaigns and to study a broader advertising and promotion strategy. Factors contributing to this need for reevaluation included the steadily declining response rates since the first mailout/mailback census in 1970 (the 1990 census witnessed a 10 percent drop in mail response and an increased undercount when compared to the 1980 census), the likelihood that people exposed to public service announcements (PSAs) would be more likely to return their questionnaires than those who had not,⁵ and studies showing that PSAs were being aired at less-than-optimal times for the greatest viewership.⁶

¹ The number of residents who filled out and returned their census forms by mail declined steadily from the 1970 to the 1990 censuses. In 1970, the mailback response rate was 78 percent of households. For the 1980 census, that rate fell to 75 percent. The 1990 census saw a continuation of the downward trend, with a final mailback response rate of 65 percent.

² W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), p. 1.

³ In 1990 the Census Bureau received the equivalent of \$65 million in pro bono advertising. The Census Bureau paid approximately \$3 million to produce and distribute the ads.

⁴ U.S. Census Bureau, "Census 2000 Operational Plan Using Traditional Census-Taking Methods," January 1999, pp. IV–1.

⁵ PSAs did not reach targeted hard-to-count populations in a strategic manner. Awareness of the census was lower for Blacks and members of other racial minorities than it was for Whites.

⁶ An audit of the 1990 media campaign found that 60 percent of the U.S. population received 91 percent of the advertising campaign's impact, while 40 percent received an impact of only 9 percent. Vitt Media International, "1990 Census Campaign Media Audit, February '90 through May '90," undated.

In an evaluation of the 1990 census, Charles Jones, associate director for Decennial Census, noted that one inherent weakness of a pro bono campaign is that the client has no control over when the advertisements will air and, therefore, which audiences messages will reach.⁷ Vitt Media's study concurred, concluding that a lack of control over PSA placement prevented the mass media⁸ campaign from attaining saturation level.⁹

As a result of its evaluation, Vitt Media recommended paid advertising be used in future censuses. Using the success of the U.S. Department of Defense's "Be All You Can Be" paid advertising campaign as an example, Vitt Media noted that congressional support and funding for paid advertising in 2000 would increase the probability of success for this strategy.¹⁰

Gilbreath Communications Inc.

In summer 1995, the Census Bureau contracted with Gilbreath Communications Inc. to assess further the feasibility of conducting a paid advertising campaign during Census 2000. Like the Vitt Media report, Gilbreath's analysis indicated that relying solely upon pro bono advertising to promote Census 2000 would limit exposure dramatically.

The analysis also indicated that reliance upon pro bono advertising would complicate efforts to customize the campaign for specific audiences. Gilbreath noted that television and radio audiences differed widely based upon race, ethnicity, region, and age and that airing PSAs during non-peak hours served no group adequately. Furthermore, an increasing number of nonprofit organizations were competing for PSA slots. Therefore, the inadequate saturation of markets evident during the 1990 campaign would be more pronounced during Census 2000.

Given pro bono advertising's drawbacks, Gilbreath proposed an extensive advertising campaign covering a 6-month period that included mainstream and minority newspapers and magazines, national and local television and radio advertising, outdoor posters, trailers attached to feature motion pictures, and public transit and Internet advertising. Gilbreath estimated the cost for buying this time at \$136 million and production costs at between \$3.8 million and \$5 million.¹¹

The research conducted by Gilbreath Communications and Vitt Media convinced the Census Bureau to conduct a 3- to 4-month campaign featuring public awareness activities in the months prior to Census Day and motivational messages during the mail return and nonresponse follow-up periods. The Census Bureau estimated the cost of such a campaign to be approximately \$100 million to \$125 million, of which 80 to 90 percent would be used to buy advertising time and space from hundreds of media outlets.¹²

DEVELOPING COOPERATIVE VENTURES (PARTNERSHIPS)

1995 Census Test

While the tests that the Census Bureau conducted between 1992 and 1994 were used to study the effects of individual changes to the census questionnaires (see Chapter 2, "Planning the Census"), the agency still needed to determine how the changes would work in aggregate. The 1995 test allowed the Census Bureau to study: (1) new uses of sampling and estimation, (2) new procedures to reduce the undercount, (3) new avenues for greater cooperation, (4) new uses of technology, and (5) new methods for collecting long-form data (see Chapter 2, Table 4, "Fundamental Changes and the 1995 Census Test").

⁷ Charles D. Jones, "Taking the Census: Lessons from 1990," *Proceedings of the 1991 Annual Meeting of the Population Association of America*, March 1991.

⁸ Meriam-Webster Online Dictionary defines the term "mass media" as "a medium of communication (as newspapers, radio, or television) that is designed to reach the mass of the people."

⁹ Vitt Media International, *1990 Census Campaign Media Audit*, February 1990 through May 1990.

¹⁰ Vitt Media International.

¹¹ For more information, see Gilbreath Communications Inc., "Advertising Research (Paid vs. Non-Paid): Preliminary Report," February 29, 1996.

¹² Aguirre International, "Communications and Motivation Strategies," May 1994; Karen Wheelless, "Evaluation of the 1990 Census Outreach and Promotions Campaign," U.S. Census Bureau, January 31, 1995; Aguirre International, "Census 2000—Advertising Research and Development," December 15, 1997.

The above five categories of change were based on the Census Bureau's basic strategies for conducting Census 2000. These strategies (building partnerships, simplifying forms and response procedures, using technology intelligently, and increasing the use of statistical methods) were at the center of its efforts to redesign the census.¹³

Four sites (three urban and one rural) were initially proposed for the 1995 census test. Of these four, three were chosen: Oakland, California; Patterson, New Jersey; and a grouping of six parishes—De Soto, Red River, Bienville, Jackson, Natchitoches, and Winn—in northwest Louisiana.¹⁴

To evaluate its proposed partnership program, the Census Bureau planned to form partnerships with other federal agencies; with state, local, American Indian tribal, and Alaska Native village governments; and with private and nonprofit organizations.¹⁵ “Partner” organizations were to collaborate with the Census Bureau to plan enumeration activities, develop and review address lists, recruit people to work on the census, and design and implement outreach and promotional activities.¹⁶ The goal of the partnerships program in the 1995 test was to determine the best approach and procedures for including local governments in the Local Update of Census Addresses (LUCA) program,¹⁷ administrative record acquisition, and outreach and promotion.

The test yielded four significant positive results concerning the partnership program. First, it led to improvements in the data in the master address file (a list of every living quarters nationwide). Second, it provided an opportunity for the Census Bureau to procure, use, and process a variety of federal, state, and local administrative records. These files demonstrated a need for improved standards for machine-readable file structures and for address sources. Third, it built cooperative relationships between the Census Bureau and local residents who distributed promotional posters and flyers and used their familiarity with the local area to promote census awareness and participation. Finally, it secured cooperation and assistance from local officials that otherwise might not have been obtained.

While the successes of the 1995 test's partnership program were encouraging, several aspects needed improvement. Specifically, the Census Bureau needed to:

- Find better ways to reach, communicate with, and support local governments.
- Pay greater attention to educating local governments and organizations about the Census Bureau and its purpose.
- Provide better instruction, training, and reference materials.
- Develop better standards on file structure and address sources when collecting administrative records.
- Provide local officials with compatible file formats and better maps to enable them to participate more effectively in the LUCA program.

¹³ U.S. Census Bureau, Decennial Management Division, 1995 Census Test Results Memorandum Series, Nos. 1–54, 1995–1996.

¹⁴ New Haven, CT, was proposed as a third urban site, but was dropped due to budgetary constraints before the test began. U.S. Census Bureau, Decennial Management Division, 1995 Census Test Results Memorandum Series, Nos. 1–54, 1995–1996.

¹⁵ U.S. Census Bureau, Decennial Management Division, 1995 Census Test Results Memorandum Series, Nos. 1–54, 1995–1996.

¹⁶ U.S. Census Bureau, “1995 Census Test Evaluation Frame Cooperative Ventures: Outreach and Promotion,” undated.

¹⁷ The addresses provided by the Census Bureau are confidential according to Title 13 of the U.S. Code. The agency offered local officials an opportunity to participate in address list review as part of the LUCA program in response to Public Law 103–430, the Census Address Improvement Act of 1994. For more information, see Chapter 11, “Legal Issues.”

-
- Ensure that critical work was completed on time and support regional offices in their efforts (such as collecting administrative records), which required processing a large number of diverse files (see Chapter 2, “Planning the Census”).¹⁸

Working Group on Cooperative Ventures

At the June and September 1994 meetings of the Decennial Census Advisory Committee, members recommended that the Census Bureau consider creating a formal cooperative effort with state, local, and tribal governments during the planning and implementation of Census 2000. The suggestion resulted in the formation of the Working Group on Cooperative Ventures to explore how the Census Bureau should implement the recommended expanded partnership effort.¹⁹

The working group was composed of 21 members representing various national government associations, a national minority association, the State Data Center Steering Committee, the 1995 census test site areas, and the Census Bureau.

The group's final report presented guidelines for partnerships the Census Bureau might undertake. It also identified activities that the Census Bureau might use to enter into closer association with state, local, and tribal governments. These activities included address list development, administrative records coverage improvement, outreach and promotion, enumeration planning and assistance, recruiting, and postcensus activities.²⁰

Partnerships Steering Committee and Partnerships Council

In March 1995, the Census Bureau announced the formation of two committees—the Partnerships Steering Committee and the Partnerships Council. The missions of these committees were to formalize and coordinate the Census Bureau's partnership efforts.

The Partnerships Steering Committee consisted of Census Bureau executive staff members and senior managers and was charged with defining the partnership program, setting policy, and developing a comprehensive approach for undertaking partnerships efforts.

The Partnerships Council, composed of management staff with experience in and knowledge of the various program areas, addressed partnership issues, drafted policy recommendations for Partnerships Steering Committee consideration, and provided guidance as needed in program-specific areas.²¹

Coordination Team for Intergovernmental Programs and Policies (CTIPP)

CTIPP provided an ongoing forum for dissemination of information concerning all partnership efforts within the Census Bureau. The CTIPP set guidelines and principles for establishing Census Bureau partnerships and reviewed partnership agreements to ensure they met accepted standards.²²

Advisory Committees

The Secretary of Commerce's Decennial Census Advisory Committee. The Decennial Census Advisory Committee (DCAC) was established in 1991, with a charter providing seats for 40 organizations.²³ As planning for the census progressed, additional organizations were invited

¹⁸ U.S. Census Bureau, “1995 Census Test Evaluation Frame Cooperative Ventures: Outreach and Promotion,” undated. See also U.S. Census Bureau, Decennial Management Division, 1995 Census Test Results Memorandum Series, Nos. 1–54, 1995–1996.

¹⁹ U.S. Census Bureau, “Final Cooperative Ventures Working Group Report,” April 18, 1995.

²⁰ Edwin B. Wagner, Jr., “Partnerships,” presented at the 2000 Census Advisory Committee Meeting, December 7–8, 1995, pp. 2–6.

²¹ *Ibid.*, p. 5.

²² LaVerne Vines Collins, “Options Paper on Cooperative Ventures with State, Local, and Tribal Governments,” U.S. Census Bureau, March 8, 1994, and U.S. Census Bureau, “Intergovernmental Census Cooperative Ventures Principles,” November 1, 1994.

²³ Following Census 2000, the committee's charter was changed to allow it to help the Census Bureau prepare for the 2010 Census and the American Community Survey. The committee was renamed to reflect its status as an ongoing committee, becoming the Decennial Census Advisory Committee.

to participate. Membership consisted of national organizations representing local, county, and state governments, and of associations serving minority and special populations, such as veterans, those with privacy concerns, the disabled, seasonal migrant farm workers, and the homeless. In addition, the DCAC included 16 ex officio members from the Postmaster General's office and the Census Bureau's oversight committee in the U.S. House of Representatives.

The DCAC primarily focused on research and design issues related to the decennial census and offered recommendations directly to the U.S. Secretary of Commerce. The committee provided a perspective from the data user community as well as a broad, national-level perspective on issues relating to special populations and to state, local, county, and tribal populations. Initially, the committee met quarterly but that was reduced to semiannually as the volume of Census 2000 data products began to dwindle.²⁴

The Census Race and Ethnic Advisory Committees. Five race and ethnic advisory committees (REACs)—African American, American Indian and Alaska Native, Asian, Hispanic, and Native Hawaiian and Other Pacific Islander—advised the Census Bureau on decennial census issues. The charter for each committee provided for nine members.²⁵

The Census Bureau created the first of its REAC groups—the African American Advisory Committee—in 1970. The current committees have been in place since 1980, with the exception of the Asian Advisory Committee and the Native Hawaiian and Other Pacific Islander Advisory Committee, which were created from the existing Asian and Pacific Islander Committee in 2000 as a result of revisions to OMB Statistical Directive No. 15.²⁶

REAC members came from academia and nonprofit, tribal leadership, and community-based organizations. The committees generally met semiannually, with each meeting lasting 2 or 3 days. Special meetings were conducted to brief committee members on the advertising, promotion, and partnership efforts for Census 2000, and the committees played important advisory roles in the review of creative concepts for advertising art, themes, and text that targeted specific race and ethnic groups, particularly hard-to-enumerate populations.

The Census Advisory Committee of Professional Associations. The Census Advisory Committee of Professional Associations consisted of 36 members chosen by the Secretary of Commerce from nominees presented by the Director of the Census Bureau. The committee represented the following organizations: the American Marketing Association, the Population Association of America, the American Statistical Association, and the American Economic Association.

The committee advised the Census Bureau on issues involving the decennial census as well as on nondecennial issues, including the economic census and other demographic and economic surveys and research. Committee meetings were generally held semiannually, supplemented by special meetings covering specific topics.²⁷

DIVISION OF LABOR FOR PLANNING AND IMPLEMENTATION

The Partnership and Marketing Steering Group (PMSG) was established to address issues related to the implementation of partnerships, paid advertising, media relations, and promotions/special events for Census 2000. The steering group was chaired by the Decennial Management Division and included representatives from the divisions involved in Census 2000 partnership and marketing activities. The group established policy guidelines and protocols that ensured the coordination and integration of marketing and partnership activities across all components of the program.²⁸

²⁴ U.S. Census Bureau, "Decennial Census Advisory Committee (DCAC)," February 3, 2005, <<http://www.census.gov/cac/www/CommitteeInfo.html#DCAC.html>> (June 9, 2005).

²⁵ U.S. Census Bureau, "Race and Ethnic Advisory Committees (REAC)," February 3, 2005, <<http://www.census.gov/cac/www/CommitteeInfo.html#DCAC.html>> (June 9, 2005).

²⁶ U.S. Office of Management and Budget Statistical Directive No. 15, "Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity," Washington, DC, October 30, 1997.

²⁷ U.S. Census Bureau, "Committee of Professional Associations (CACPA)," February 3, 2005, <<http://www.census.gov/cac/www/CommitteeInfo.html#DCAC.html>> (June 9, 2005).

²⁸ U.S. Census Bureau, "Census 2000 Partnership and Marketing Program—Program Master Plan," Census 2000 Information Memorandum No. 59, June 6, 2000, p. ii.

Under the PMSG's guidance, successful implementation of the Census 2000 Partnership and Marketing Program required collaboration among several Census Bureau offices, both at the agency's headquarters and in the field, as shown in Table 4-1.

Table 4-1.
Division of Labor

Function	Office or contractor responsible for implementation
Program management	Decennial Management Division
National partnership development	Field/Partnership and Data Services Program, Customer Liaison Office, Public Information Office, Congressional Affairs Office, Census 2000 Publicity Office, Director's Office, 21st Century Expo Group (contractor), ²⁹ Sykes Communications (contractor) ³⁰
Regional partnership development	Field/regional census centers
Paid advertising	Census 2000 Publicity Office, Young & Rubicam (contractor)
Media relations	Public Information Office, field/regional census centers
Promotions/special events	Census 2000 Publicity Office, field/regional census centers, Decennial Management Division, Geography Division, Scholastic Inc. (contractor), ³¹ Cohn & Wolfe (contractor) ³²
Communication and region support	Field Directorate (Partnership and Data Services Program), National Processing Center

SAMPLING AND DUAL-TRACK PLANNING

In the fall of 1997, the threat of a stalemate between the congressional leadership and the Clinton administration in the debate over the use of statistical sampling was resolved by a compromise in the fiscal year 1998 U.S. Department of Commerce appropriations bill that President Clinton signed into law.³³ The legislation allowed the Census Bureau to continue to plan for the use of sampling, but required it to plan for a census without sampling for nonresponse follow-up and statistical adjustment as well. Thus, the Census Bureau was required to undertake dual-track planning.³⁴

The law also sought to provide an opportunity for expedited judicial review of the legality and/or constitutionality of using sampling methods to produce population figures for apportionment or redistricting purposes. Additionally, the statute established a Census Monitoring Board to oversee

²⁹ Under the supervision of the PDSP, the 21st Century Expo Group was contracted to establish and maintain partnerships with 150 national nongovernmental organizations. (A number of staff members at 21st Century Expo worked on the 1990 census outreach and promotion program and therefore already had established relationships with many of these organizations.)

³⁰ Sykes Communications was contracted to develop partnerships with 100 Fortune 500 corporations and 100 companies in smaller markets whose customers were among the historically undercounted populations.

³¹ Scholastic Inc. worked with Young & Rubicam to prepare and distribute Census in Schools program materials for students, teachers, and parents and included editorials and announcements in teacher editions of classroom magazines and articles in Scholastic classroom magazines.

³² Cohn & Wolfe developed the Census 2000 public relations campaign. For more information, see the Integrated Marketing Strategy section in this chapter.

³³ Public Law 105-119, 105th Congress, 1st Session. (1997), Departments of Commerce, Justice, and State, the Judiciary and Related Agencies Appropriations Act of 1998.

³⁴ In late November 1997, Congress passed H.R. 2267, the Commerce, Justice, State Appropriations Act, and it was signed by President Clinton. The President originally vetoed H.R. 2267; however, he agreed to sign it after a compromise regarding the issue of Census 2000 was worked out between the administration and the House of Representatives. See Chapter 11, "Legal Issues," for more information. In the compromise language of H.R. 2267, the House allowed for the possibility of bringing a lawsuit in federal district court (to be heard by a three-judge panel, at least one of whom was a circuit judge) by either of the two Houses of Congress, individual representatives, or senators, and any resident of a state whose congressional representation could be changed as a result of the use of a statistical method to determine that state's population. In addition, it allowed for a particular lawsuit to be filed by the Speaker, "on behalf of the House of Representatives." Furthermore, H.R. 2267 allowed for any party to such a lawsuit to appeal the district court ruling directly to the U.S. Supreme Court, bypassing the U.S. Court of Appeals.

the planning and conduct of Census 2000. As part of the compromise, but not contained in the text of the enacted legislation, the Census Bureau was required to modify its plans for the 1998 Dress Rehearsal to include one site at which methods for use in a nonsampling census would be tested³⁵ (see Chapter 2, “Planning the Census”).

INTEGRATED MARKETING STRATEGY

As noted, the Census 2000 Partnership and Marketing Program (PMP) was an integrated communications effort designed to increase awareness of Census 2000 and boost response rates. The strategy was developed and coordinated by the Census Bureau's Communications Directorate and consisted of five elements: (1) direct mail, (2) advertising, (3) promotions and special events, (4) media relations, and (5) partnerships. The Census Bureau conducted PMP activities in three phases (excluding the planning phase): (1) education, (2) motivation, and (3) nonresponse follow-up.

The education phase, implemented between November 1999 and January 2000, was designed to familiarize the public with the census and educate it about its purposes. Included were national television, radio, newspaper, and magazine advertising aimed at those target audiences that were least likely to respond.

The motivation phase was launched in January and concluded in April 2000. It utilized English and non-English print and broadcast media, as well as the Internet, to motivate the population to participate in Census 2000. The primary message was “This is your future. Don’t leave it blank.” (see Table 4-3 for additional population-specific taglines).

The nonresponse follow-up communications phase started shortly before the Census Bureau started nonresponse follow-up operations, and it concluded in June 2000. The advertising messages during this phase stressed the importance of cooperating with enumerators and targeted the population through a variety of media, including radio, television, newspapers, and magazines.³⁶

Prior to Census Day, the PMP focused on building awareness that Census Day was approaching and the census product would benefit the community. During the mailout/mailback phase of census questionnaire distribution, the campaign sought to motivate people to return their questionnaires promptly to increase the initial mail response rates. Finally, the PMP encouraged cooperation with census enumerators during the operation that followed up with nonresponding households and reminded people that the census was not over.

DECISION TO USE PAID ADVERTISING

The Census Bureau concluded that the 6-month campaign proposed in the Gilbreath Communications Inc. report was both too long and too expensive. Census Bureau executives decided instead to use a 3- to 4-month campaign that combined public awareness in the months prior to Census Day with motivational messages during the mail return and nonresponse follow-up periods. The estimated cost of the campaign was approximately \$100 million, of which 80 percent to 90 percent was to be earmarked for buying advertising time and space from hundreds of media outlets.

To become informed about the tasks ahead, the Census Bureau studied the advertising campaigns of the U.S. Marine Corps, the National Guard, the U.S. Postal Service, and the U.S. Bureau of Engraving and Printing, among others. In addition, it consulted with the American Association of Advertising Agencies and the Advertising Research Foundation prior to issuing a request for proposals.³⁷

³⁵ For a more detailed account of the provisions of Public Law 105-119 representing the compromise on the sampling issue and the outcome of the court cases pertaining to sampling, see Chapter 11, “Legal Issues.”

³⁶ W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Census 2000 Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), p. 2.

³⁷ U.S. Census Bureau, “Selection of Young & Rubicam and Their Partner Agencies for Census 2000 Advertising Campaign,” October 13, 1999, pp. 2–3.

Acquisition Team

The Census Bureau selected staff with experience in the decennial census, marketing, field operations, and contracting as well as specialists in writing and managing contracts. These staff members came from the Census Bureau, other federal agencies, and the private sector.³⁸

Development of Request for Proposals

The timetable for writing, approving, and issuing the final request for proposals (RFP) was as follows:

- November 22, 1996—The notice of a draft statement of work was published in the *Commerce Business Daily* and sent to more than 500 prospective bidders nationwide for comment and possible interest.
- December 1996—The draft statement of work was mailed to approximately 500 advertising agencies requesting input prior to the release of the final RFP.
- February 28, 1997—A presolicitation conference was held at Census Bureau headquarters; 245 people representing 159 companies attended.
- May 13, 1997—The RFP was issued.
- June 26, 1997—Proposals were due.³⁹

Selection Process

The Census Bureau organized a group of third-party advisors with expertise in government contracting, advertising, and outreach to minority audiences to assist in the contractor selection process. The advisors were present for the final contractor oral presentations and were briefed by the technical evaluation team.⁴⁰

The Census Bureau used formal procedures for source selection, including the designation of a source selection official and the establishment of a Source Selection Evaluation Board.⁴¹ A Source Selection Plan outlined the entire process used for the acquisition and included technical evaluation, cost evaluation, and acquisition components.⁴² This ensured scrutiny of the acquisition process and recommendations of the cost and technical teams by the Census Bureau.⁴³

The Census Bureau received 11 proposals during the solicitation period and, basing its decision on cost and past performance measures, the technical evaluation team selected four firms to make oral presentations. These were conducted from August 26 through August 29, 1997. Representatives from each firm were allotted 2 hours to present their basic approach to conducting the national campaign by explaining the creative and media plans contained in the technical proposals submitted, addressing the specific tasks to be performed during the campaign, proposing a detailed plan to measure campaign performance and effectiveness through the capture of campaign statistical data, and planned campaign cost containment measures.⁴⁴

³⁸ Ibid., pp. 3–4.

³⁹ U.S. Census Bureau, “Background/History of Contract,” undated, p. 3.

⁴⁰ Eleven technical evaluations were conducted from June 30, 1997, through July 28, 1997. U.S. Census Bureau, “Selection of Young & Rubicam and Their Partner Agencies for Census 2000 Advertising Campaign,” October 13, 1999, pp. 3–4.

⁴¹ See *Commerce Acquisitions Manual: Source Selection Procedures*, Office of Procurement and Management, U.S. Department of Commerce, May 1989.

⁴² The Acquisition Plan was approved by the U.S. Department of Commerce on April 24, 1997. The department’s Contracted Services Review Board approved the Census Bureau’s request to contract for a paid advertising campaign on April 18, 1997.

⁴³ U.S. Census Bureau, “Advertising Services for Census 2000: Acquisitions Plan,” Washington, DC, April 27, 1997.

⁴⁴ U.S. Census Bureau, “Selection of Young & Rubicam and Their Partner Agencies for Census 2000 Advertising Campaign,” October 13, 1999, p. 4.

The representatives were instructed to include in the presentation time a 30-minute question and answer period to explain the benefits of the proposed campaign approach in terms of a realistic return on investment. They were also instructed to present a customized approach to reaching two target groups—single African American and single Hispanic U.S.-born males.

At the conclusion of each presentation, the evaluation team convened to discuss the presentation and to score specific aspects of the proposed campaign. Final cost and technical reports for each were presented to the Source Selection Evaluation Board for review.

The Source Selection Evaluation Board reviewed the reports compiled by the Census Bureau's advisors following the oral and creative presentations conducted in August 1997. On September 17, 1997, the board recommended awarding the contract to Young & Rubicam Inc (Y&R), and briefed the Census Bureau's source selection official (Paula Schneider). A legal review to determine if there was adequate support to recommend Y&R in the Source Selection Evaluation Board's report was concluded on September 23, 1997. The Census Bureau's source selection official rendered her final decision to select Y&R on September 25, 1997.⁴⁵

YOUNG & RUBICAM (Y&R)

On October 10, 1997, the Census Bureau officially announced the award of the Census 2000 advertising contract to Y&R and a consortium of four partner agencies:⁴⁶

- The Bravo Group (a Y&R subsidiary), with expertise in reaching Hispanic populations.
- Mosaica, succeeded by Kang & Lee,⁴⁷ targeted Asian, emerging European, and Arabic-speaking populations.
- J. Curtis, succeeded by Chisholm-Mingo, targeted African American audiences and emerging African and Caribbean populations.
- A Native American-owned company, g&g, developed advertising for the American Indian and Alaska Native population.⁴⁸

The Census Bureau also contracted with Young & Rubicam of Puerto Rico, a subsidiary of Y&R, to develop and implement the paid advertising campaign for Puerto Rico. Creative concepts and Spanish dialects were tailored for the Puerto Rican culture and language. Young & Rubicam, Miami, conducted the advertising campaign for the Island Areas.⁴⁹

Focus Groups and Market Research

Y&R hired the Maya Group to conduct research that would evaluate the advertising for its ability, across all ethnic target groups, to capture attention, appeal to target audiences, communicate strategic messages, and involve and motivate residents to cooperate in the census process. More than 15 race and ethnic groups were included in the research effort. Individually targeted campaigns focused on American Indians and Alaska Natives, Hispanics, Asians, and African Americans. Another component, "Diverse America," targeted all U.S. residents 18 years and older who used English-language media. In addition, Y&R researched and reported on a category called "emerging markets," which consisted of population groups, such as Nigerians, Jamaicans, Ghanaians, and Haitians, that had experienced significant recent growth.

⁴⁵ Ibid., pp. 4–6.

⁴⁶ "Census Bureau Announces Award of Census 2000 Advertising Contract," U.S. Department of Commerce News, Press Release, CB97–C.26 (Revised), October 10, 1997.

⁴⁷ Kang & Lee was merged with Mosaica; the expanded company took the name of Kang & Lee.

⁴⁸ In addition to partnering with these four firms, Y&R had the most aggressive subcontracting plan for hiring all categories of small, small and disadvantaged, and woman-owned firms, which Y&R estimated to be approximately \$87 million of the advertising contract. Y&R's goal was to spend 40 percent (\$35 million) of subcontract dollars with small businesses, 32 percent (\$27 million) with small and disadvantaged firms, and 2 percent (\$1.6 million) with woman-owned businesses. Y&R's plan was approved and praised by the Office of Small and Disadvantaged Business Utilization on September 10, 1997.

⁴⁹ Kenneth Meyer, "Draft Decision Memo for Dr. Prewitt," undated, and correspondence between Young & Rubicam Inc. and U.S. Census Bureau, June 14, 1999.

The Maya Group conducted qualitative and quantitative research throughout the country in March and April 1999 to test and refine messages for Census 2000. The company recruited more than 1,700 individuals representing the various target markets across the U.S. and the Pacific Island Areas to view and respond to potential print concepts and television ads. Smaller focus group discussions were held following the viewings. While this research revealed a number of barriers to census participation (including confidentiality concerns, language barriers, and mistrust of government), it indicated that one of the Census Bureau's biggest challenges would be to counter the feeling of many participants that the census was not relevant to them or their communities. The solution was for the ads to focus on the benefits of participating in the census for both individual respondents and their communities.⁵⁰

Market Segmentation

Each component of the Census 2000 Partnership and Marketing Program (PMP)—direct mail advertising, partnerships, promotions and special events, media relations, and direct mail—was new, expanded, or significantly modified from 1990. The paid advertising campaign was based on a “likelihood to respond model” of the U.S. population, called the “Likelihood Spectrum.”TM The Likelihood SpectrumTM was an audience segmentation model with specific actions targeted at specific segments of the population. Y&R took as a proxy measure for this likelihood the number of civic activities in which an individual participated: most likely to respond were those participating in five or more civic activities, undecided or passive were those with one to four activities, and least likely were those with no civic activities. For the most-likely-to-respond segment, the approach called for extensive use of the national media. The national media plan was supplemented with additional select national media for the undecided/passive group, including Sunday and late night programming. For the least-likely-to-respond segment, Y&R planned additional advertising, including daytime television and out-of-home advertising.

The Y&R campaign was further segmented by race and ethnic group, in particular targeting traditionally difficult-to-enumerate populations: African Americans, Hispanics, Asians, American Indians/Alaska Natives, and Native Hawaiians and other Pacific Islanders. The primary slogan for the campaign, selected to promote beliefs of personal and community benefits and stimulate return of the census form, was: “This is your future. Don’t leave it blank.” Research had indicated that the benefits message was the most persuasive. There were variations of this slogan for different race and ethnic groups.⁵¹

Although the dress rehearsal was not designed to be a full test of the advertising campaign, it was an opportunity to test creative concepts and review Census Bureau procedures. Upon being awarded the contract, Y&R and its partners immediately began developing the advertising campaign to be tested in the Census 2000 Dress Rehearsal. Building upon the marketing activities of the 1980 and 1990 censuses, the Census 2000 promotion program consisted of direct mail, targeted community outreach, traditional public relations, and special events. The program was more comprehensive and better integrated than previous Census Bureau efforts.⁵²

The Census Bureau selected three sites for the Census 2000 Dress Rehearsal—Sacramento, California; the city of Columbia, South Carolina, and 11 surrounding counties; and the Menominee American Indian Reservation in Wisconsin. The combination of a large urban site, a small

⁵⁰ Young & Rubicam Inc., “Advertising Research,” Vols. 1–3, April 1999; U.S. Census Bureau, “Questions and Answers, Advertising Campaign for Census 2000 for Census 2000 Agency Partners,” 1999; and U.S. Census Monitoring Board, “Report to Congress,” October 1, 1999.

⁵¹ Young & Rubicam Inc., “Technical Proposal,” Vol. No. 1, Response to Solicitation No. 52-SOBC-7-00002, June 26, 1997, pp. 3–12; Young & Rubicam Inc., “Census 2000: National Advertising Strategy Review,” March 19, 1998; and Young & Rubicam Inc., “Overview of Census 2000 Advertising Program,” October 26, 1998.

⁵² W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), pp. 1–3.

city-suburban-rural site, and an American Indian Reservation site provided a comprehensive testing environment for refining planned Census 2000 methodology and reflected characteristics the Census Bureau believed would provide a good operational test of Census 2000 procedures and systems.⁵³

The Census Bureau began preparing for the dress rehearsal during the summer of 1996 by working with local officials and community-based organizations in each of the three sites and beginning to plan and build the various infrastructures needed for the dress rehearsal. These activities included refining the geographic database, building and refining the address list, and working with community and tribal organizations to plan outreach and promotion efforts.

The Dress Rehearsal Advertising Campaign

Components of the paid advertising campaign planned for Census 2000 were implemented in all three dress rehearsal sites.⁵⁴ The campaign was designed to increase awareness of the Census 2000 Dress Rehearsal among both the general public and hard-to-reach minority subgroups. The marketing strategy included advertisements delivered through print media, radio, television, out-of-home media (billboards, bus shelters, posters, mobile billboards, and advertisements on shopping carts and in beauty salons, convenience stores, and check-cashing establishments), and a special school-based public information campaign.⁵⁵

Advertising began the first week of March 1998 and continued (for some media) until the last week in June. The Census Bureau contracted with Westat to conduct a telephone survey of residents at these sites by telephone before and after the campaign to measure their awareness of the dress rehearsal. Within each sample household, the person who usually opened the mail for that household was interviewed.

The advertising campaign sought to increase awareness of the dress rehearsal by at least 30 percent—a goal consistent with the results of the 1990 Outreach Evaluation Survey.

Although an evaluation of the campaign concentrated specifically on the efforts of paid advertising for the dress rehearsal, local partnership program activities, and receipt of a prenotice letter, census form, and reminder postcard were designed to enhance awareness. In addition, both before and during the campaign, there was national media coverage of the debate over sampling for Census 2000 (see Chapter 11, “Legal Issues”). This coverage may have increased awareness of the census as well.⁵⁶

Census 2000 Dress Rehearsal Evaluation

The Census Bureau hired Westat to evaluate the dress rehearsal using a pre- and postcampaign survey design to conduct random digit dial (RDD) telephone interviews with households in Sacramento, CA, and the Columbia, SC, metropolitan area. The limited number of households in Menominee, WI, precluded its inclusion in the evaluation.⁵⁷

Precampaign surveys were conducted at both sites in February and March 1998, prior to the major advertising buildup for the dress rehearsal. Westat completed 565 interviews in Sacramento, with a response rate of 25 percent. Westat completed 817 interviews in South Carolina, with a response rate of 28 percent.⁵⁸

⁵³ “CA, WI, SC Selected for Census 2000 Dress Rehearsal,” U.S. Department of Commerce News, Press Release, CB96-O.15, July 29, 1996.

⁵⁴ The Census 2000 Dress Rehearsal’s advertising campaign on the Menominee Indian Reservation was not included in the evaluations of the advertising campaign because of the size of its population.

⁵⁵ U.S. Census Bureau, “Census 2000 Dress Rehearsal Evaluation Summary,” August 1999, pp. 11–12.

⁵⁶ *Ibid.*, pp. 47–52.

⁵⁷ W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), pp. 3–4.

⁵⁸ U.S. Census Bureau, “Census 2000 Partnership and Marketing Evaluation-D1,” December 4, 2001, p. 3.

Postcampaign surveys were conducted by Westat from April to June 1998 (after the replacement questionnaire had been mailed⁵⁹) as the advertising campaign was winding down. Westat completed 1,504 interviews in Sacramento, with a 54 percent response rate. Westat completed 1,506 interviews in South Carolina, with a 64 percent response rate.⁶⁰

The evaluation of the advertising campaign at the South Carolina and Sacramento, California, sites found that:

- Advertising increased awareness about the census. In Sacramento, the percent of residents who had seen or heard anything recently about the census rose from 28 percent before the campaign to 80 percent after it. In South Carolina, the percentage increased from 29 percent before the campaign to 89 percent after. This increase in awareness surpassed the 30 percent level set as the goal for the paid advertising campaign.⁶¹
- Awareness was highest among non-Hispanic Whites and those with higher levels of education and income. However, large proportions of targeted groups often coincident with low income and low education individuals and targeted race and ethnic groups were also found to have heard of the campaign.
- Television was the most effective medium, reaching 62 percent of respondents in Sacramento and 68 percent at the South Carolina site. Television also reached larger proportions of each of the targeted subgroups than any other medium.
- Among media other than television, magazines were the least effective, reaching 13 percent of the population in Sacramento and 16 percent in South Carolina.
- There was a positive relationship between reported advertising exposure and level of census knowledge, even when controlling for other factors, such as race/ethnicity, income, and education. This relationship was particularly pronounced for populations containing Asians, and Native Hawaiians and Pacific Islanders in Sacramento. However, non-Hispanic Whites continued to have significantly higher levels of census knowledge after the campaign compared to the target race and ethnic groups.
- Level of civic participation and expectation of the form before it arrived were both found to be strongly associated with the likelihood of mailing back the form.⁶²

The dress rehearsal also examined the effectiveness of the Be Counted program (see below), which provided a means for persons to be included in the census who may not have received a census questionnaire, believed they were not included on one, or had no usual address on Census Day at which to be counted.

During the dress rehearsal at the three sites, a total of 2,379 Be Counted forms were returned. Of these, 1,523 were eligible to be included in the census. From these forms, a total of 1,707 persons were enumerated who would not otherwise have been included in the Census 2000 Dress Rehearsal.⁶³

The General Accounting Office also issued a report on the Census 2000 Dress Rehearsal in July 1998. The report indicated that staffing and completion of field operations in the dress rehearsal appeared to have been successful, but that mail response rates remained problematic and local partnerships had limited successes.⁶⁴

⁵⁹ In mailout/mailback areas (see Chapter 5, “Data Collection”), the mail implementation strategy consisted of four items: (1) an advance letter informing households of the census and delivery of the census questionnaire, (2) an initial questionnaire, (3) a reminder postcard, and (4) a replacement questionnaire, which was sent to all addresses in the mailout/mailback universe shortly before Census Day, regardless of whether a household had returned the initial questionnaire or not.

⁶⁰ U.S. Census Bureau, “Census 2000 Partnership and Marketing Evaluation-D1,” December 4, 2001, p. 3.

⁶¹ Factors, other than advertising, may have affected awareness, including mailout of dress rehearsal questionnaires during the awareness period studied.

⁶² Edwards and Wilson and U.S. Census Bureau, “Census 2000 Partnership and Marketing Evaluation-D1,” December 4, 2001.

⁶³ Ibid.

⁶⁴ General Accounting Office, “Preliminary Observations on the Results to Date of the Dress Rehearsal and the Census Bureau’s Readiness for 2000,” July 30, 1998.

CENSUS 2000 PAID ADVERTISING

Anticipating that its Census 2000 advertising campaign would be of interest to various media outlets, the Census Bureau held a “launch event” on October 27, 1999, at the Ronald Reagan Building and International Trade Center in Washington, DC. The event offered the media an opportunity to preview the specific elements of the advertising campaign and served to highlight the Census Bureau’s stated commitment to conducting a thorough, fair, and accurate census.

The theme of the event—“Everybody Counts!”—underscored the inclusive nature of the event. Event speakers included then-Secretary of Commerce William Daley; Director of the Census Bureau Kenneth Prewitt; Under Secretary for Economic Affairs Robert Shapiro; Representatives Dan Miller (R-FL) and Carolyn Maloney (D-NY); and Chief of Partnership and Data Services Branch Brenda August. Young & Rubicam (Y&R) gave a video presentation of the advertising campaign, and exhibit booths provided further information on the advertisements and the public relations outreach programs.⁶⁵

Census 2000 Advertising Phases

As noted earlier, the Census Bureau’s integrated marketing strategy for Census 2000 was delivered in three operational phases: (1) education, (2) motivation, and (3) nonresponse follow-up.

The education phase (November 1999 to January 2000) was designed to familiarize some segments of the public with the census and educate them about its purposes. It included national television, radio, newspaper, and magazine advertising aimed at the segment of the general public least likely to respond.

The motivation phase (January to April 2000) utilized English and non-English print and broadcast media, as well as the Internet, to motivate the population to participate in Census 2000. The primary message of this phase was to participate in Census 2000 by mailing back a census form—“This is your future. Don’t leave it blank.”

The nonresponse follow-up phase began shortly before the Census Bureau started nonresponse follow-up operations and concluded in June 2000. The advertising messages during this phase stressed the importance of cooperating with enumerators and targeted the population through radio and television advertising.⁶⁶

Media Buying Strategy

Y&R targeted general and specific non-English speaking and hard-to-enumerate populations in its media-buying strategy.⁶⁷

The strategy exposed all segments of the population to Census 2000 advertising during a three-stage campaign. The first stage, conducted between November 1999 and January 2000, served to educate the public about the importance of the coming census and to prepare the population for the questionnaire mailout. The second stage, conducted between late February and the end of March 2000, reminded households to return their questionnaires, reinforced previous messages concerning the importance of census participation, and made households aware that nonresponse follow-up operations would seek completed questionnaires from nonrespondent households. The final stage, which concluded in June 2000, coincided with the beginning and end of nonresponse follow-up operations.⁶⁸

⁶⁵ “Census 2000 to Launch Largest-Ever Outreach Campaign,” U.S. Department of Commerce News, Press Release, CB99-CN.52, October 25, 1999.

⁶⁶ W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), p. 2.

⁶⁷ *Ibid.*, pp. 2–3.

⁶⁸ *Ibid.*

Census 2000 Logo

The Census 2000 logo was chosen following focus-group testing conducted in Charleston, WV, (October 9, 1996) and Baltimore, MD, (October 17, 1996). The logo appeared on all printed Census 2000 advertising, promotional products, and mailings, including the census questionnaires, cover letters, and envelopes.⁶⁹

Variations of the logo also were created for other population groups as specified in Table 4-2.

Table 4-2.
Census 2000 Logos⁷⁰

Product/service	Target audience	Language(s)	Agency primarily responsible
U.S. Census 2000 (red and white)	Diverse America ⁷¹ and African American	English	Y&R
Census 2000 (red and white)	Hispanic (stateside)	English	Bravo Group
Censo 2000 (yellow and black)	Hispanic (Puerto Rico)	Spanish	Y&R Puerto Rico
Census 2000 (circular feather motif; red and black)	American Indian and Alaska Native	English	g&g
U.S. Census 2000 (standard logo with brief in-language definition of the census)	Asian	English logo followed by a statement in at least eight Asian languages.	Kang & Lee
U.S. Census 2000 (standard logo with brief in-language definition of the census)	Polish-, Russian-, and Arabic-speaking	English logo with brief statement underneath in Polish, Arabic, Russian, and other languages as determined.	Kang & Lee

Census 2000 Tagline

Throughout Census 2000, the tagline “This is your future. Don’t leave it blank.” was used for the general advertising campaign. The Census Bureau tweaked the tagline to make it relevant to various target audiences. Similar advertising messages were created for the minority campaigns (see Table 4-3).⁷²

Table 4-3.
Census 2000 Taglines

Slogan	Target audience	Language	Agency primarily responsible
“This is your future. Don’t leave it blank.”	Diverse America	English	Y&R
“This is our future. Make yourself count.”	Hispanic	Spanish	Bravo Group
“Generations are counting on this. Don’t leave it blank.”	American Indian and Alaska Native	English	g&g
“Census 2000. Your answers determine your future. Don’t leave it blank.”	Asian	Chinese, Japanese, Tagalog, Korean, Vietnamese	Kang & Lee
“This is our future. Don’t leave it blank.”	African American	English	Chisholm-Mingo

⁶⁹ U.S. Census Bureau, “United States Census 2000 Style Guide,” 1999.

⁷⁰ Ibid.

⁷¹ Referred to all audiences that consumed English-language media.

⁷² Research indicated that one of these six languages was spoken well enough in 99 percent of the households to avoid linguistically isolating respondents.

Table 4-3.
Census 2000 Taglines—Con.

Slogan	Target audience	Language	Agency primarily responsible
"This is your future. Make yourself count." ⁷³	Puerto Rico	Spanish	Y&R Puerto Rico
"This is your future. Don't leave it blank."	Arabic-speaking	Arabic	Kang & Lee
"This is your future. Don't leave it blank."	Polish-speaking	Polish	Kang & Lee
"This is your future. Don't leave it blank."	Russian-speaking	Russian	Kang & Lee

An early education campaign launched in November 1999 targeted households least likely to respond. The message in the early education campaign explained the census's importance to individuals, what it consisted of, and how federal money was allocated according to census figures.

Advertising also was designed to accompany the Census Bureau's nonresponse follow-up operations, using the advertising message: "It's not too late. Cooperate when somebody comes to your door." This campaign targeted geographic areas with the highest rates of nonrespondent households.⁷⁴

Cost of the Media Campaign

Table 4-4 shows the cost of the paid media campaign for Census 2000 subdivided by target market.

Table 4-4.
Paid Media Expenditures for Census 2000 by Target Market⁷⁵

Target market	Expenditure (in dollars)	Percent of total
Diverse America	57,915,896	52.6
African American/Black emerging markets	17,020,901	15.5
Hispanic	18,886,479	17.2
Asian	10,016,100	9.1
Emerging markets	1,508,400	1.4
Hawaii	146,800	0.1
American Indian/Alaska Native	2,803,800	2.5
Puerto Rico	1,298,300	1.2
Island Areas	421,500	0.4
Total	110,018,176	100.0

Table 4-5 summarizes media expenditures by type of medium purchased.

Table 4-5.
Net Expenditures by Media Type⁷⁶

Media type	Total expense (in dollars)	Percent of total expense
National		
Television	53,087,925	48.3
Radio	10,344,852	9.4
Magazines	5,346,265	4.9
Newspapers	3,875,009	3.5

⁷³ The Puerto Rico tagline had been "Don't Leave Your Future Blank." It was changed to "This is your future. Make yourself count." to coincide with the stateside Hispanic tagline.

⁷⁴ U.S. Census Bureau, "Style Guide for Census 2000 Taglines," January 28, 2002, <<http://www.census.gov/dmd/www/tagstyle.html>> (June 9, 2005).

⁷⁵ U.S. Census Bureau, "Total Actualized Net Expenditures—Planned vs. Actual," undated.

⁷⁶ Ibid.

Table 4-5.
Net Expenditures by Media Type⁷⁶—Con.

Media type	Total expense (in dollars)	Percent of total expense
Local		
Television	11,534,063	10.5
Radio	14,628,420	13.3
Magazines.....	179,228	0.2
Newspapers	7,463,003	6.8
Out of home	2,754,330	2.5
Miscellaneous.....	805,081	0.7
Total	110,018,176	100.0

Census 2000 “Fine Arts” Posters

As in past censuses, the Census Bureau printed and distributed a series of “fine arts” posters targeting specific race and ethnic groups. For Census 2000, the Census Bureau’s Race and Ethnic Advisory Committees (REACs) chose artwork from the Smithsonian’s Museum of American Art.⁷⁷

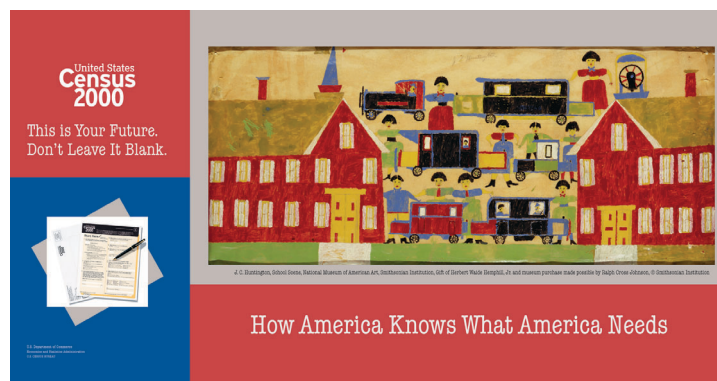
The following 13 fine arts posters, representing specific race, ethnic, and population groups, were printed and distributed to Census 2000 partners. Modified versions of the descriptions that accompany images of the posters on the Census Bureau Web site at <<http://www.census.gov/dmd/www/advposters.html>> also follow. Some poster images are not included below because of usage rights.

▪ African American: *Family*, by Romare Bearden

African American artist Romare Bearden was born in North Carolina, raised in Harlem and Pittsburgh, and became an artist after earning a degree in mathematics at New York University. In 1935, he drew political cartoons for the Baltimore *Afro-American*.

During the civil rights movement, Bearden was a social worker in Harlem and encouraged many young Black artists to continue their work. His innovative use of collage earned him numerous awards and honors, including the National Medal of Arts. His own childhood memories inspired *Family*, the collage on wood selected for the Census 2000 poster. The work served as the model for a ceramic tile wall mural for a federal building in Queens, NY.

The U.S. General Services Administration Art-in-Architecture Program transferred this model to the Smithsonian Institution’s National Museum of American Art.⁷⁸



▪ Rural America: *School Scene*, by J.C. Huntington

J.C. Huntington reportedly was a retired railroad worker who lived in Sunbury, PA, in the 1920s. *School Scene*, the artwork selected for the Census 2000 poster, was created using enamel paint and pencil on paper. The Smithsonian Institution’s National Museum of American Art obtained this work through a gift of Herbert Waide Hemphill Jr. and a museum purchase made possible by Ralph Cross Johnson.⁷⁹

⁷⁷ Jennifer Marks and Judith Waldrop, e-mail correspondence, U.S. Census Bureau, December 2–3, 2004.

⁷⁸ U.S. Census Bureau, “Census Marketing: Posters,” February 14, 2000, <<http://www.census.gov/dmd/www/advposters.html>> (May 31, 2005).

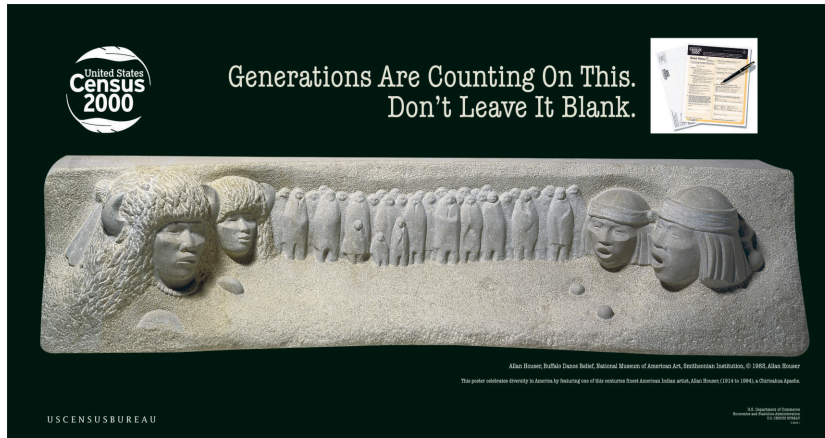
⁷⁹ Ibid.

▪ **Public Libraries: *The Library*, by Jacob Lawrence**

Jacob Lawrence is the first African American artist to be inducted into the American Academy of Arts and Letters. Lawrence was born in Atlantic City, NJ. At age 15 he decided to become a painter and attended formal art classes at the 135th Street branch of the New York Public Library.

The Library, the artwork selected for the Census 2000 poster, recalls childhood visits to the public library where Lawrence spent many hours reading, attending performances and lectures, and seeing art exhibitions. Lawrence used the library to conduct research for several of his paintings, including his renowned series *The Migration of the Negro*.

The Library, a tempera on fiberboard, was a gift of S.C. Johnson & Son Inc. to the Smithsonian Institution's National Museum of American Art.⁸⁰



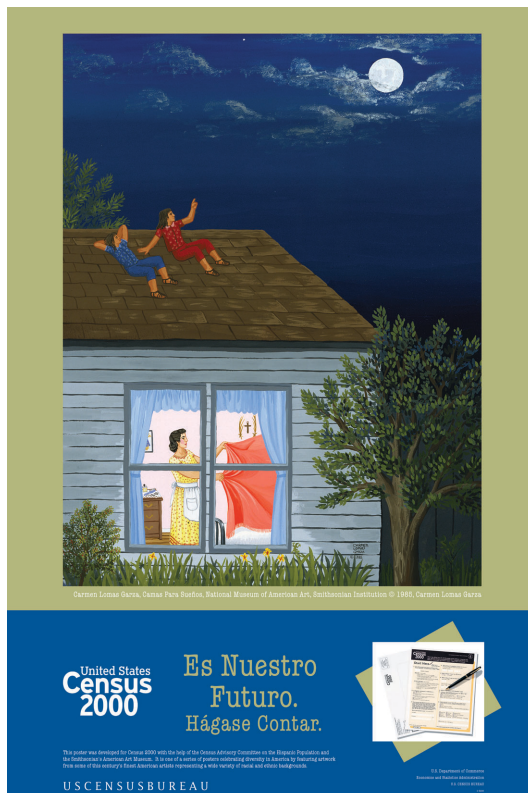
▪ **American Indian: *Buffalo Dance*, by Allan Houser**

Allan Houser, a member of the Chiricahua Apache tribe, was the first Native American to receive the country's highest art award, the National Medal of Arts. Just before his death in 1994, his sculpture of an American Eagle became the first gift crafted by an American Indian given to a foreign head-of-state, the

Emperor of Japan. Houser's work can be seen at the United Nations in New York City, the British Royal Collection, and in countless private, corporate, and museum collections. *Buffalo Dance*, the artwork chosen for the Census 2000 poster, presents costumed dancers and singers performing a New Mexican pueblo ceremony. It was purchased through the Alice Rossin Colquitt Fund, Frank E. Everett, and the Smithsonian Collections Acquisition Program for the Smithsonian Institution's National Museum of American Art.⁸¹

⁸⁰ Ibid.

⁸¹ Ibid.



▪ Hispanic: *Camas para Sueños*, by Carmen Lomas Garza

Carmen Lomas Garza was a member of the national Hispanic American task force created by the National Endowment for the Arts. She was also a recipient of grants from the National Endowment for the Arts and California Arts Council. Most of her paintings celebrate childhood memories of growing up in Kingsville, TX. The selection for the Census 2000 poster, *Camas para Sueños* or *Beds for Dreams*, was inspired by youthful conversations with her sister and their desire to become artists. This gouache on paper was purchased through the Smithsonian Collections Acquisition Program for the National Museum of American Art.⁸²

▪ Asian: *Branches III*, by Hung Liu

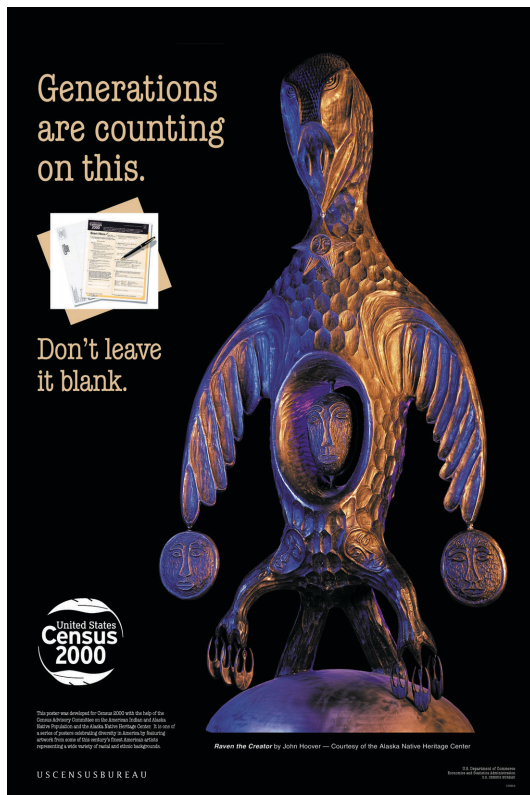
Born in China in 1948, Hung Liu was sent to the countryside for “proletarian reeducation” during the Cultural Revolution. After teaching at the Central Academy of Fine Art in Beijing, she was accepted into the Graduate Program in Visual Arts at the University of California. She has taught in the art department at Mills College in Oakland, CA.

Hung Liu is a two-time recipient of a National Endowment for the Arts Painting Fellowship, as well as many other awards. The artwork chosen for the Census 2000 poster, *Branches III*, is the third panel in a triptych (an artwork in three parts). As a whole, this artwork tells the story of an Asian American family over three generations. The third generation is depicted in this final panel. The artwork can be found at the Steinbaum Krauss Gallery in New York City.⁸³



⁸² Ibid.

⁸³ Ibid.



■ Alaska Native: *Raven The Creator*, by John Hoover

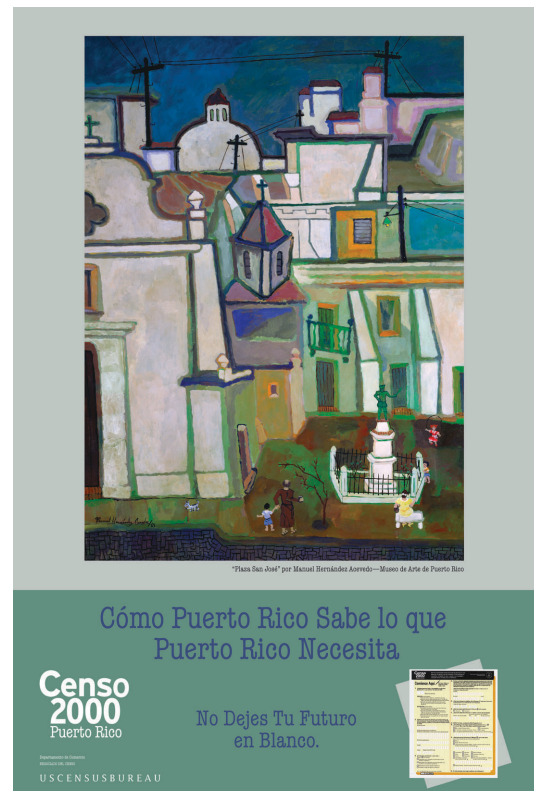
John Hoover, an Aleut, was born in Cordova, AK. While largely self-taught, he has studied art with Leon Derbyshire in Seattle and has exhibited internationally. In the sculpture chosen for the Census 2000 poster, *Raven The Creator*, Hoover has added elements from the different legends about the Raven. Stars dangle from the Raven's beak, the sun and the moon hang from each wing. The human figures in his claws are formed to resemble the triptych icons used by the Orthodox faithful throughout the Aleut regions. The human face in the belly of the Raven represents Mother Earth. The face at the back of the head of the Raven is symbolic of the many transformations made by Raven. *Raven the Creator* is owned by the Alaska Native Heritage Center in Anchorage.⁸⁴

■ Puerto Rico: *Plaza San José*, by Manuel Hernández Acevedo

Manuel Hernández Acevedo completed his education through the fourth grade and then went to work as a shoemaker, an apprentice sign painter, and cook. While working at the Workshop for Graphic Arts of the Community Education Division for the Department of Public Instruction, he was inspired by other artists at the studio. His favorite scenes were of streets and houses of old San Juan in which the viewer can appreciate strange little details, like fence posts, overhead power wires, and small kites. *Plaza San José*, the artwork selected for the Census 2000 poster, is in the collection of the new Museo de Arte de Puerto Rico in San Juan.⁸⁵

⁸⁴ Ibid.

⁸⁵ Ibid.



▪ **Pacific Islander: *The New Quilt*, by Herb Kawainui Kane**

Herb Kawainui Kane is an artist-historian and author with special interest in Hawaii and the South Pacific. Born in 1928, he was raised in Hawaii (Waipio Valley and Hilo) and in Wisconsin. He holds a master's degree from the Art Institute of Chicago and the University of Chicago. In 1984, he was elected a Living Treasure of Hawaii. In the 1987 "Year of the Hawaiian Celebration," he was one of 16 persons chosen as Pookela (Champion). From 1988 to 1992, he served as a founding trustee of the Native Hawaiian Culture and Arts Program, a federal program at Bishop Museum. He is the 1998 recipient of the Bishop Museum's Charles Reed Bishop Medal. *The New Quilt*, the work selected for a Census 2000 poster, shows traditional Pacific Island quilt making, using a breadfruit design.⁸⁶



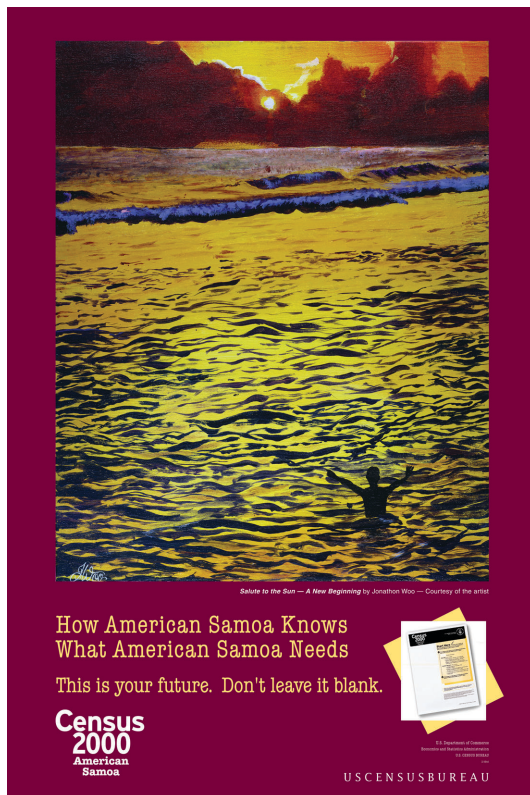
▪ **Northern Mariana Islands: *Passage to the New World*, by Frank S. Palacios and Soo Seon Jeong**

For its Census 2000 poster, the Commonwealth of the Northern Mariana Islands chose artwork by two students from Marianas High School's award-winning art club, Ali'i Creations. In *Passage to the New World*, Franklin S. Palacios and Soo Seon Jeong blend many things unique to the Northern Mariana Islands, including indigenous flowers, the Carolinian canoe, and the Latte Stone. The Carolinian canoe is a tribute to the Carolinian people, who are known for their navigational skills. The Latte Stone represents the Chamoro people, who carve these stones to use as supporting beams for their homes.

Both artists were high school seniors when they collaborated on their pieces. At the time, Soo Seon Jeong intended to travel to Korea and Japan to learn about ancient artists. Frank Palacios planned to continue his art studies in college and develop his own unique style. Their artwork was awarded the Governor's Choice Award in 1999.⁸⁷

⁸⁶ Ibid.

⁸⁷ Ibid.

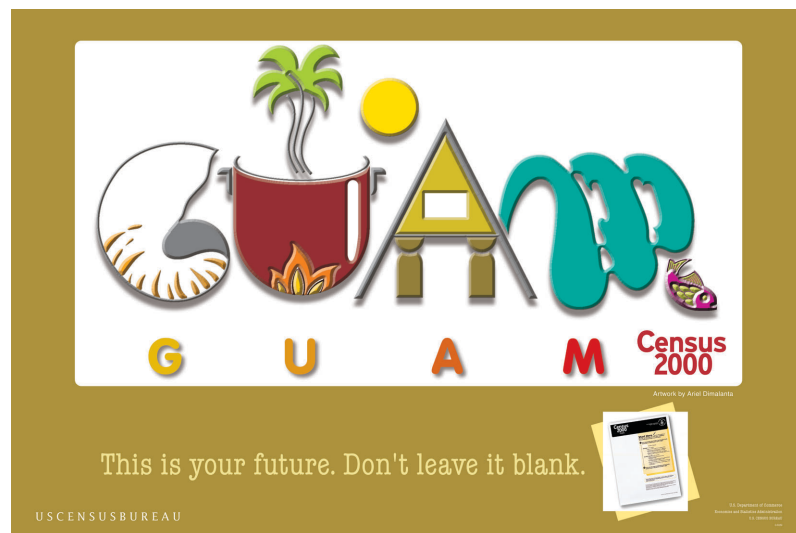


▪ **American Samoa: *Salute to the Sun—A New Beginning*, by Jonathon Woo**

Jonathon Woo was born in American Samoa in 1978. He graduated from the American Samoa Community College in 1999 with an associate arts degree with an emphasis on art. He created *Salute to the Sun—A New Beginning* while he was a student at Arizona State University. He planned to specialize in animation. *Salute to the Sun—A New Beginning* was selected for the Census 2000 poster for American Samoa. It celebrates his homeland as it enters the new millennium.⁸⁸

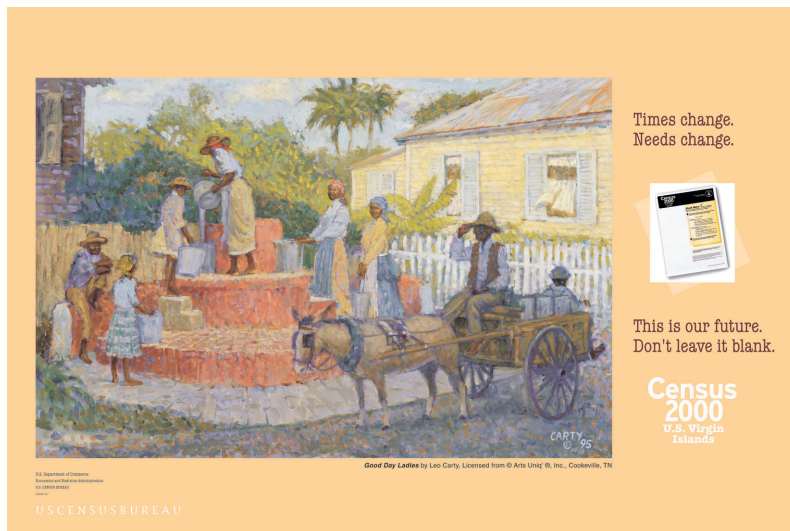
▪ **Guam: *Guam*, by Ariel Dimalanta**

Ariel Dimalanta is an award-winning graphic designer and creative director with more than 25 years of experience. He was born in Tamuning, Guam, raised off-island, schooled in California art colleges, and professionally honed on Guam. He began his career as a graphic artist for the *Pacific Daily News* in 1973. Dimalanta was president and creative director of his own multimedia graphic design company on Guam when his design, *Guam*, was selected for Guam's Census 2000 poster. The artwork is filled with symbols of the islands.⁸⁹



⁸⁸ Ibid.

⁸⁹ Ibid.



▪ U.S. Virgin Islands: *Good Day Ladies*, by Leo Carty

Leo Carty thrives on studying the heritage of Black people living in the Virgin Islands and portraying their lifestyles at the turn of the century. Beautiful and historical buildings on the islands provide a rich cultural backdrop for his scenes. The artwork selected for the Census 2000 poster for the Virgin Islands, *Good Day Ladies*, is a good example of Carty's trademark style.⁹⁰

DIRECT MAIL

In developing the direct mail campaign for Census 2000, the Census Bureau was guided by the expertise of the country's direct mail community, which stressed attractive graphics; colors that stood out; clear, crisp language; unique packaging; and research conducted on variants of the 1990 census questionnaire.⁹¹

The 1990 census forms were designed primarily to reduce processing costs. However, because these neglected customer needs, they may have cost the agency in terms of reduced response rates. The development process for Census 2000 forms began in 1991 at the Social and Economic Sciences Research Center (SESRC) at Washington State University. Planners concluded that substituting the user friendly forms could improve overall response rates by about 43 to 76 percent in test situations.⁹²

At SESRC's recommendation, the Census Bureau implemented a program of mailing advance letters, respondent-friendly questionnaires, reminder/thank you postcards, and replacement questionnaires.⁹³ The questionnaire included a statement informing respondents that their responses were required by law.⁹⁴

Census mail pieces, including the advance letter, questionnaire, and reminder postcard, were sent directly to U.S. households to inform them of the upcoming census and to encourage their response. The mail implementation strategy involved multiple contacts and was based on research showing that as the number of contacts increased, so did respondents' willingness to participate. Although not part of the advertising campaign, the mailing pieces were designed to be user-friendly, and they incorporated icons and messages about the benefits of the census that were intended to improve response. Advertisements incorporated images of the questionnaire to increase its familiarity to the public.⁹⁵

⁹⁰ Ibid.

⁹¹ W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), pp. 2–3.

⁹² The Social and Economic Sciences Research Center at Washington State University is a provider of survey research services. It is the largest university-based survey research center in the Pacific Northwest and conducts approximately 50 survey-related projects a year, most of which involve mail, telephone, or other self-administered questionnaires.

⁹³ While the Census Bureau wanted to send a targeted second mailing of questionnaire to nonrespondents, this operation was dropped because the direct mail industry could not process the address list fast enough to send them out.

⁹⁴ U.S. Census Bureau, "Decennial Marketing Plan (Draft): How Can Marketing Increase Respondent Cooperation in the Decennial Census and What Are Its Limitations," December 2, 1996, pp. 4–5.

⁹⁵ See research by Two Twelve Associates Inc. and Dr. Don Dillman, Washington State University, described in Chapter 2, "Planning the Census."

PROMOTIONS AND SPECIAL EVENTS

How America Knows What America Needs (HAKWAN)

The How America Knows What America Needs (HAKWAN) promotion was divided into three components. '90 Plus Five challenged the highest elected officials in communities to become participants in the campaign and commit to helping their communities increase initial response rates by 5 percent over the 1990 mailback response rate. Both the Because You Count component and later, Quality Counts, urged communities' highest elected officials to promote cooperation with census takers and explained operational activities that occurred during these phases of the HAKWAN campaign.

To aid HAKWAN participants, the Census Bureau developed a tool kit consisting of materials officials could use to promote the campaign at the grassroots level. The tool kits included such items as media announcements, speech inserts, and "op-ed" articles. Tool kits were updated as needed. A Web site allowed participants to download tool kit materials and receive other information about the progress of Census 2000.⁹⁶

Census 2000 Road Tour

The goals of the Census 2000 Road Tour were to generate local and regional interest, to educate the public about the importance and benefits of census participation, and to garner local press coverage. From February 15 through April 15, 2000, 12 customized Census 2000 mobile headquarters buses toured more than 125 major media markets. Regional directors, headquarters staff, and two contractors (Cohn & Wolfe Public Relations and B.M. Productions) planned the route for each bus through one or two census regions, with stops in key markets and exhibits in such high traffic areas as transit stations, special events, town centers, and malls. The audio and video exhibits focused on the history and importance of the U.S. census. Printed materials were made available for distribution to visitors.⁹⁷

TeamFed

An interdivisional team of Census Bureau staff (organized in February 1999) implemented various programs to generate interagency enthusiasm about the Census 2000 effort. TeamFed identified the following five main areas in which government agencies could help in the Census 2000 campaign:

- Promotion of Census 2000.
- Assistance in recruiting census workers.
- Provision of waivers for income earned from working on the census for those receiving benefits through means-tested programs.
- Provision of space for testing and training.
- Provision of emergency equipment or space support when needed by local census offices.

As a result of a new Clinton administration policy allowing federal employees to work on the Census 2000 campaign in addition to their noncensus federal employment, Commerce Secretary William Daley encouraged the heads of departments and agencies to assist the Census Bureau in recruiting people to work on Census 2000. Federal agencies named a representative (usually from the agency's human resources staff) who helped the Census Bureau's human resources and field offices recruit federal employees for the Census 2000 campaign.

⁹⁶ U.S. Census Bureau, "Census 2000 Public Relations Analysis Report," pp. 21–32.

⁹⁷ U.S. Census Bureau, "Census 2000 Road Tour: Executive Summary," undated (ca. 1999); U.S. Census Bureau, "Regional Partnership Report: Portrait of America," FLD/00-PR2, Washington, DC, March 2001, p. 16.

After naming agency representatives, TeamFed managers created a timeline through April 2000 showing assigned activities to be completed. The Census Bureau provided promotional materials, fact sheets, drop-in articles, and speakers to assist agencies in carrying out these activities and programs.

Working with individual agencies enabled TeamFed to distribute Census 2000 posters, insert relevant information in agency newsletters and paycheck stubs, recruit census workers from within the federal government, and provide waivers for income earned from working for those receiving benefits through means-tested programs.

The Census Bureau also partnered with the U.S. Economics and Statistics Administration (ESA) on some institutional outreach programs. In this arrangement, the Census Bureau's communications directorate took over after the ESA started the programs. President Clinton did his part by delivering a radio address, along with publishing a Census 2000 proclamation. A "Census Day" Congressional Concurrent Resolution was also introduced in the U.S. House of Representatives, with U.S. Senate concurrence.⁹⁸

Census in Schools

Scholastic Inc., under contract to the Census Bureau, designed the Census in Schools project to teach students what a census was and why it was important to participate. It was expected that upon learning about the census, the children would share what they had learned with their parents or caregivers.

Census in Schools packages were sent to nearly 2 million educators by the end of March 2000. Each package contained a hands-on project, which introduced elementary and secondary students in schools across the nation to Census 2000. Also included were a 24-page teaching guide for teachers (*Making Sense of Census 2000*) and a 4-page handout for each student. The teaching guide for Grades K–4, for example, included three lessons for Grades K–2 and three lessons for Grades 3–4. Teaching kits were printed in English, and the take-home activities were available in English, Spanish, Chinese, Vietnamese, Korean, and Tagalog.⁹⁹

In addition to *Making Sense of Census 2000* teaching guides, the Census in Schools program created and distributed 45 million handouts containing census-related activities to elementary and middle school students, and Census 2000 kits were distributed to principals (in the United States, Puerto Rico, and Island Areas), adult education and English as a second language programs, and Head Start centers.

To complement these materials, Census in Schools designated March 13 to 17, 2000, as "Teach Census Week." During that week, Count von Count, from the Public Broadcasting System's *Sesame Street*, appeared at a press conference in Washington, DC, promoting participation in the census. Many schools held Census 2000 rallies, featuring children singing "I Count," the Census 2000 song.¹⁰⁰

Public Service Announcements (PSAs)

Throughout Census 2000, the Census Bureau was challenged with creating new ways to educate the public on the importance of the census and the benefits that participation would mean for communities. Taking into consideration the effectiveness of the paid advertising campaigns used in Census 2000, the Census Bureau wanted to target celebrities who would capture the attention of the public.

⁹⁸ U.S. Census Bureau, "Census 2000 Public Relations Analysis Report," pp. 39–41.

⁹⁹ *Ibid.*, p. 42.

¹⁰⁰ In addition to the national "Teach Census Week" activities, individual school systems organized their own promotional activities. Such activities included the design and placement of a Census 2000 billboard in Pinson, AL, by Rudd Middle School students. (Two students, their principal, and a social studies teacher were promoted as "Census Heroes" by the Secretary of Commerce at the National Press Club in Washington, DC, for their efforts.) Other schools included Census 2000 articles in their student newspapers. Staff from the student newspaper at Choctawhatchee High School, Fort Walton Beach, FL, developed and distributed a Census 2000 newspaper and distributed it to 19,000 kindergarten through sixth-grade students in their community. See U.S. Census Bureau, "Census in Schools Highlights," <<http://www.census.gov/dmd/www/hilites.html>> (November 17, 2005).

Given the widespread popularity and patriotism associated with baseball in the United States, the Census Bureau sought a strategic partnership with Major League Baseball and *Sports Illustrated* to encourage the public's participation in the census. Major League Baseball All-Stars Barry Bonds (San Francisco Giants), Ivan Rodriguez (Texas Rangers), and Derek Jeter (New York Yankees) were chosen because of their "role model" images to deliver a public service announcement (PSA) that appealed to the diverse audience the Census Bureau needed to reach.

The PSAs, which specifically addressed the issue of confidentiality of the census form, were released during the nonresponse follow-up phase of Census 2000 and complemented other out-reach efforts of the campaign that were already underway.

During the Because You Count component of the campaign, media specialists sought assistance from numerous professional athletic teams and sporting venues around the country in promoting Census 2000. Because the program took place during the playoff period for the National Basketball Association and National Hockey League, a number of teams from both leagues agreed to use the PSAs during their series. Each league's flagship stations broadcast the PSAs, dramatically expanding the audience reach.

In addition to PSAs, the Census Bureau developed audio news releases (ANRs) featuring Barry Bonds and Ivan Rodriguez. The ANRs consisted of two separate interviews with each player. The first, done for the '90 Plus Five component, urged the public to fill out and mail back their questionnaires. The second, for the Because You Count component, stressed the importance of cooperating with census takers. The taped interviews were fed via satellite to 3,200 radio stations nationwide and pitched by media specialists to the prospective markets that each player represented.¹⁰¹

MEDIA RELATIONS

In 1990, a traditional public relations effort was conducted from the Census Bureau's headquarters and resulted in approximately 12,000 telephone contacts from various media outlets. For Census 2000, the process was decentralized, with media specialists assigned directly to field offices where they developed relationships with local media outlets and responded to media inquiries.

The Census Bureau recognized that the media could present news stories critical of Census 2000. The agency tried to encourage the media to disseminate several core messages supporting its out-reach efforts. It set up a series of news conferences and other media events in support of public outreach components of the Census 2000 Partnership and Marketing Program, such as How America Knows What America Needs, the Census 2000 Road Tour, and Census in Schools.

The Census Bureau's Public Information Office (PIO) fielded all media inquiries for the duration of Census 2000. The PIO organized numerous media briefings and made the Director of the Census Bureau available at editorial boards in cities throughout the country. The Director also conducted periodic operational briefings to keep the Washington, DC, press corps up to date. Targeted media outreach ensured that the needs of key reporters were met and facilitated strategic story placements.

The daily "clipping" (provided by a private vendor) included print and broadcast media at the national and local levels and enabled the Census Bureau's Decennial Media Relations Team (DMRT¹⁰²) to identify emerging or breaking news stories that should be emphasized or could cause problems. Once these news stories were identified, an appropriate response strategy was developed.

Targeted media opportunities were organized and overseen by the PIO's DMRT in cooperation with field personnel. For each, the Director of the Census Bureau traveled to a target city where he participated in a series of broadcast and print media interviews.

¹⁰¹ Prepared statement of Kenneth Prewitt, Director, U.S. Census Bureau, before the Subcommittee on the Census, Committee on Government Reform, U.S. House of Representatives, March 8, 2000; U.S. Census Bureau, "Census 2000 Public Relations Analysis Report," pp. 45–47.

¹⁰² The DMRT began as an office within the Census 2000 Publicity Office during the planning phase of the census and moved to the PIO for implementation.

DMRT media specialists began by researching the markets to identify media opportunities. Once these were identified, media specialists contacted the various editors and producers to discuss the possibility of an interview with the Census Bureau Director and explain why such an interview would be of interest to their readers/audience. The DMRT media specialists provided the Director with a full briefing on each scheduled interview and developed a profile of the media outlet and program that included information on the topics to be discussed. Scheduling conflicts at the local level as well as with the Director's office made media trips difficult.

When a media event in the field was planned for the director, the regional staffs spent a considerable amount of time assisting with the planning and implementation. Given the already heavy workloads of the regional staff, it was not always easy for the regions to find the manpower and resources necessary to prepare for a trip by the Director.¹⁰³

Operational Press Briefings

With logistical support from Cohn & Wolfe, operational briefings took place every 2 to 3 weeks in Washington, DC. The briefings were simulcast on the Internet and included a 1-800 call-in number for interested reporters outside the Washington, DC, area.¹⁰⁴

Media Education

Ongoing efforts ensured that the media regularly received the information and materials necessary to cover the Census 2000 story accurately and avoid negative news stories based on inaccurate information. Daily monitoring also helped by providing reporters with correct facts and figures.

Analysis of daily news about Census 2000 operations revealed that print media focused on Census 2000 and the apportionment of the U.S. House of Representatives; resource allocation as a result of Census 2000 data; census confidentiality; civic ceremonies related to Census 2000; the unprecedented outreach efforts used during Census 2000. The analysis found that of all print coverage of Census 2000, 69 percent was positive.¹⁰⁵

Media Training

The perceived intrusiveness of the long form elicited questions from Congress and the media. Census Bureau Director Prewitt anticipated that many of the participants would ask about the controversy, and he prepared for answering questions by participating in media training. The training was taped by a film crew. The media trainer posed as a reporter conducting an interview. Following each interview, Director Prewitt and the media trainer critiqued his performance and made necessary adjustments.¹⁰⁶

Media Relations Results

From October 1999 through September 2000, the television and cable broadcast coverage of Census 2000 reached a potential audience of over 220 million.¹⁰⁷ As Table 4-6 illustrates, the amount of print coverage also was impressive when compared to the same time period during the 1990 census.¹⁰⁸

¹⁰³ U.S. Census Bureau, "Census 2000 Public Relations Analysis Report," pp. 48–49.

¹⁰⁴ *Ibid.*, p. 49.

¹⁰⁵ *Ibid.*, p. 50.

¹⁰⁶ *Ibid.* Similar training was made available to Census Bureau employees who frequently communicated with the public and media regarding Census 2000, the Census Bureau, and other agency censuses and surveys.

¹⁰⁷ The Census 2000 public relations campaign culminated with the release of the final response rates on September 19, 2000. The response rates represented the number of housing units that returned a census questionnaire by mail, Internet, telephone, or Be Counted forms.

¹⁰⁸ "Census 2000 Public Relations Analysis Report," p. 53.

Table 4-6.
Comparison of the 1990 Census and Census 2000 News Articles¹⁰⁹

Month	1989/1990	1999/2000
October	791	2,242
November	906	1,898
December	774	2,077
January	1,009	2,484
February	911	2,030
March	1,848	3,721
April	1,535	4,211
May	1,076	1,807
June	1,029	2,020
July	783	1,956
Total	10,662	24,446

COMMUNICATIONS GUIDE

The duration of Census 2000 and its complex nature encouraged the Census Bureau to make sure that all relevant personnel commenting on Census 2000 stayed “on message” throughout the campaign. To do this, the *Census 2000 Communications Guide* was created as a resource for census officials, ensuring “one message” and one voice for all public and media queries, speeches, and talking points at events across the country. It was used by staff and officials at both the Census Bureau and U.S. Department of Commerce to provide succinct, factual statements about Census 2000 processes and the Census Bureau.

The 2000 guide was much more informative than the 1990 version. The *Census 2000 Communications Guide* was distributed to relevant employees at Census Bureau headquarters and field personnel and to the Department of Commerce in April 2000.¹¹⁰

CRISIS COMMUNICATIONS GUIDE

Census 2000 involved the efforts of hundreds of thousands of people across the country. Given the extent of the effort, the Census Bureau required a framework for addressing potential crises. Developing this framework involved designing sets of procedures and guidelines to be followed in relevant situations. The Census Bureau developed two crisis communications manuals—one for field personnel and one for headquarters personnel—that clearly articulated these procedures and guidelines.

The manuals contained all of the necessary information for responding to a crisis. Along with detailed information on how to recognize a crisis and the proper procedures to follow, the guides explained how to respond to the media and listed contact information for Census Bureau personnel who needed to be informed of the situation. Additionally, key personnel in the field and at headquarters underwent crisis training sessions that included a series of mock on-camera interviews. Based on their performance, the trainer recommended ways to improve interview skills.¹¹¹

CENSUS 2000 PARTNERSHIP PROGRAM

History of the Outreach Program

Formal partnerships started with the 1980 census. The thought was to increase communication among local and national organizations and thereby increase the mail response rates (especially for minority populations).

¹⁰⁹ Ibid., p. 60.

¹¹⁰ Ibid., pp. 54–56.

¹¹¹ Ibid., pp. 57–59.

The 1990 census sought to expand on the earlier partnership program by increasing participation among racial, ethnic, and other special populations that had been undercounted in previous censuses. The 1990 program was very successful in terms of interaction with religious organizations and schools during 1990, but less so among other groups, especially those considered hard to enumerate.¹¹²

Program Planning for Census 2000

The Census Bureau held two conferences to explore the extent to which local and national organizations and governments could assist with Census 2000.¹¹³ These conferences were:

- National Conference of Governments on Census 2000¹¹⁴
- National Conference on Census 2000 Partnerships.¹¹⁵

Planning for the Census 2000 Partnership Program included developing a mission statement, goals, and objectives, as well as a detailed plan of action for the program. The intent was to develop an aggressive, comprehensive program that incorporated the assistance and resources of governmental units, community-based organizations, religious groups, and businesses in conducting an efficient and accurate Census 2000.¹¹⁶ The partnership program would work in conjunction with other components of the integrated marketing strategy (paid advertising, direct mail, promotions and special events, and media relations), to increase awareness about Census 2000 and thereby lift response rates, especially in historically undercounted populations.

Because nongovernmental organizations wield substantial influence over significant portions of the population, especially those with local chapters and affiliates, they were tremendous partnership assets.

The national partnerships were designed to encourage and offer guidance to governmental and nongovernmental organizations that sponsored or supported promotional activities. The Census Bureau partnered with major businesses to promote the census.

At the regional level, the partnership program reflected the Census Bureau's belief that the foundation for broad-based participation in the census must be built at the community level. The program's objective in the regions was to establish partnerships with state, local, and tribal governments; community-based organizations; businesses; and the media. This work was carried out by partnership specialists in the 12 Census Bureau regional offices.¹¹⁷

Program Staffing and Responsibilities

Countrywide, the partnership program employed more than 600 partnership specialists skilled in community outreach, communications, grassroots organizing, and media relations.¹¹⁸ The specialists' overall racial and ethnic diversity mirrored the makeup of the country and brought linguistic skills representing 36 languages. The staff worked throughout the country, but concentrated in

¹¹² Marvin D. Raines, "Partnership Program for Census 2000," presentation for an international trip to South Africa, July 2001, p. 3.

¹¹³ Ibid., p. 3.

¹¹⁴ U.S. Census Bureau, "Final Report of the National Conference of Governments on Census 2000," Washington, DC, April 1997.

¹¹⁵ U.S. Census Bureau, "Proceedings of the 1997 National Conference on Census 2000 Partnerships," Washington, DC, May 1997.

¹¹⁶ Marvin D. Raines, "Partnership Program for Census 2000," presentation for an international trip to South Africa, July 2001, p. 4.

¹¹⁷ Ibid., p. 5.

¹¹⁸ All partnership specialists completed a four-stage training process to ensure that they had the information and skills necessary to speak knowledgeably about Census 2000 operations and to negotiate effective partnerships. The topics covered were: (1) The Census Bureau and Regional Office, (2) Building Partnerships—Preparation for Implementation, (3) Negotiation, Intercultural Communication, and Media Relations, and (4) Regional Quarterly Updates.

areas that had historically low response rates during previous censuses. Partnership specialists and administrative support personnel were managed by a team of two partnership coordinators in most of the regions.¹¹⁹

At the regional level, staffing and activities changed according to the Census 2000 Partnership and Marketing Program (PMP) phases of activity as follows:

- **Planning phase (October 1996 to July 1998).** The Census Bureau began by hiring one partnership specialist per region. This specialist established partnerships with state, local, and tribal governments and invited partners to participate in geographic programs, appoint tribal liaisons, establish Complete Count Committees, and appoint governor's liaisons. During this phase, tasks included developing regional partnership plans; identifying new/emerging populations, partners, and community leaders; assisting governments in establishing Complete Count Committees; supporting recruiting efforts; and working with contractors to ensure coordination and integration of Census 2000's marketing strategy.¹²⁰ By the end of the planning phase in July 1998, the agency had hired about 150 full- and part-time partnership staff to cover the entire country.
- **Education phase (August 1998 to December 1999).** By April 1999, the Census Bureau had hired nearly 400 headquarters and regional partnership staffers, including clerical workers and media specialists, as well as partnership coordinators and team leaders to supervise the growing staff. By the end of the education phase, the entire complement of 690 full- and part-time partnership staff was on board at headquarters and throughout the country.

During the education phase, partnership specialists implemented regional plans; established local partnerships; supported regional census center operations; and identified sites for Be Counted and Questionnaire Assistance Centers.¹²¹

- **Motivation phase (January to April 2000).** During this phase, partnership specialists moved from developing awareness to motivating action. As part of their new responsibility, the specialists stressed the benefits and confidentiality of the census; ensured integration between partnerships and operations; and distributed and encouraged use of materials in schools, in religious organizations, and by other partners.¹²²
- **Nonresponse follow-up (NRFU) phase (May to July 2000).** During this final phase, partnership specialists were responsible for motivating nonrespondents in low response areas and encouraging the public's cooperation with enumerators. Following NRFU and the Accuracy and Coverage Evaluation, partnership specialists implemented the "Thank You" campaign.¹²³

At the national (headquarters) level, the Partnership and Data Services Program staff provided administrative and logistical support, oversaw special initiatives and programs, organized conferences and meetings, developed promotional items, and acted as liaisons to the many programs that were part of the Census 2000 integrated marketing strategy (Census 2000 Road Tour, Census in Schools, etc.).¹²⁴

Media Partnership Specialists

Media partnership specialists were key to the media relations component of the integrated marketing strategy. They facilitated positive and educational coverage by electronic and print media and reinforced marketing messages.

¹¹⁹ Marvin D. Raines, "Partnership Program for Census 2000," presentation for an international trip to South Africa, July 2001, p. 5.

¹²⁰ Ibid., pp. 5–6.

¹²¹ Ibid., pp. 6–7; U.S. Census Bureau, "Census 2000 Partnership Debriefing Report: 1996–2000," June 2001, p. 2; U.S. Census Bureau, "Partnership Report 2000," Vol. 1, pp. 8–9; U.S. General Accounting Office, "2000 Census: Review of Partnership Program Highlights Best Practices for Future Operations," GAO-01-579, August 2001, pp. 10–12.

¹²² Marvin D. Raines, "Partnership Program for Census 2000," presentation for an international trip to South Africa, July 2001, p. 7.

¹²³ Ibid.

¹²⁴ Ibid., p. 8.

Census 2000 media partnership specialists also coordinated local media, encouraging Census 2000 coverage in the various news media. They coordinated with the Census Bureau's Public Information Office at headquarters on various media projects and responded to media inquiries about Census 2000.¹²⁵

Types of Partners

The Census 2000 Partnership Program worked with federal, local, and tribal governments; public and private businesses; and religious, civic, youth, and trade organizations in support of Census 2000.¹²⁶ Partners assisted with recruiting, promotion, and data collection support.¹²⁷

Types of Partnership Activities

Complete Count Committees. As in 1990, Census 2000 promotion was aided by the creation of hundreds of privately funded Complete Count Committees, which consisted of elected officials, businesses, social service organizations, and community members. These committees were responsible for developing and implementing census awareness programs in particular locations. The committees sponsored promotional events, provided the Census Bureau with testing and training space for enumerators, and worked with local media to publicize census activities.

The Complete Count Committees stressed the importance of responding voluntarily to the census and reminded the community members of the Census Bureau's commitment to data confidentiality. In materials designed to guide the Complete Count Committees, the Census Bureau encouraged localizing the message by identifying federally funded programs that benefitted a committee's particular community and making sure local residents understood that the data used by such programs came from the Census Bureau.¹²⁸

Governor's Liaison Program. The Governor's Liaison Program created partnerships between state governors and the Census Bureau. Each governor appointed a liaison to serve as the point of contact for all Census 2000 activities. The liaison informed the Census Bureau about state issues, helped resolve problems, publicized the census, and in some cases served as a conduit for establishing State Complete Count Committees.¹²⁹

Tribal Government Liaison Program. The Census Bureau invited each federally recognized American Indian tribal government to designate a tribal liaison to assess the Census Bureau's efforts to get an accurate census on reservations and other tribal areas.¹³⁰

Census 2000 and Congregations. The Census Bureau enlisted the support of religious leaders in communities with historically low participation to spread the word to their congregations about the importance of participating in the census. Part of this effort included development of a public outreach campaign in which religious leaders were provided information kits to help them educate their communities and keep them current on census activities. The kits included the "What Congregations Should Know About Census 2000" brochure and a series of weekly announcements and "drop-in" announcements on Census 2000 activities for bulletins and newsletters.¹³¹

¹²⁵ Ibid., p. 9.

¹²⁶ Ibid., pp. 9–10.

¹²⁷ Ibid., pp. 10–11. Partners were asked to assist with recruiting tasks, including the identification of candidates for census jobs, identifying space for testing and training, and posting recruiting information. Partners assisted with promotional activities that included publicizing the importance of the census, dispelling myths and misconceptions about the census, encouraging participation, organizing local committees to target outreach efforts, conducting/sponsoring Census 2000 events, and producing and distributing census promotional materials. Partners provided data collection support by correcting address lists, identifying unusual housing patterns and hard-to-enumerate areas, telling the Census Bureau where to place Be Counted forms, offering/identifying sites for Questionnaire Assistance Centers.

¹²⁸ U.S. Census Bureau, "Partnership Report," Vol. 1, Washington, DC, 2000, p. 4.

¹²⁹ Ibid., p. 4.

¹³⁰ U.S. Census Bureau, "Tribal Government Liaison Program Handbook," April 1999.

¹³¹ Ibid., p. 44.

Questionnaire Assistance Centers. This program assisted people who had questions about completing the questionnaire, who needed language assistance, or who did not receive a questionnaire¹³² (see Chapter 5, “Data Collection”).

Be Counted Program. After the nonresponse follow-up programs of the 1980 and 1990 censuses, the Census Bureau implemented a campaign called “Were You Counted?” This gave people who believed they had not been counted an opportunity to participate in the census. The Were You Counted campaign printed forms in local newspapers and other media. People believing they had not been counted were encouraged to complete and return a Were You Counted form.¹³³

The Census 2000 “Be Counted” campaign was similar to Were You Counted. Although not as widely distributed as the earlier forms, Be Counted forms in English, Spanish, Chinese, Korean, Tagalog, and Vietnamese were available at approximately 85,000 sites and at Questionnaire Assistance Centers. The Census Bureau printed and distributed about 16 million forms in anticipation of having 1 million completed forms returned.

The Census Bureau made the Be Counted forms available on March 31, 2000, and removed them from the sites on April 17, 2000. These dates coincided with Census Day (April 1, 2000) and the start of the nonresponse follow-up operation. Respondents were able to call a Telephone Questionnaire Assistance number and, if they met certain criteria, could provide their short-form data via telephone interview. Respondents who did not know their census IDs (the bar code number on the mailed questionnaires) could request questionnaires, and Be Counted forms would be mailed to them. Forms received from people with no usual residence were tabulated in the service-based enumeration population (see Chapter 5, “Data Collection”).

The Be Counted campaign was considered a success because it enumerated tens of thousands of people who otherwise would have gone uncounted.¹³⁴

Special Initiatives

The Census 2000 Partnership Program undertook a number of “special initiatives” (i.e., supplemental efforts) to support its regional and national programs. Between January and August 2000, it implemented 14 special initiatives to help the regions expand their outreach to hard-to-enumerate populations and increase mail response.¹³⁵

Natural Disasters Special Initiative (Hurricane Floyd/Flooding Component). With assistance from community leaders as well as business leaders and the Federal Emergency Management Agency, the Natural Disasters Special Initiative identified areas where special enumeration procedures were needed in order to reach victims of natural disasters such as hurricanes, floods, and tornadoes.

In support of this effort, the Census Bureau distributed Census 2000 literature kits in English and Spanish to victims in affected areas, recruited local officials and celebrities, and offered a toll-free telephone number to the regional census center that residents could call to learn more about the special enumeration procedures affecting them as a result of a natural disaster in their area.¹³⁶

Large City and State Special Initiative. Between March and June 2000, the Large Cities and States Special Initiative implemented strategies to improve census knowledge in hard-to-enumerate areas in large cities and states. Materials were made available in eight languages—English, Spanish, Hmong, Laotian, Cambodian, Thai, Russian, and Polish.

¹³² U.S. Census Bureau, “Questionnaire Assistance Centers for Census 2000,” Census 2000 Evaluation No. H.4., June 25, 2003, p. ii.

¹³³ The 1980 “Were You Counted?” evaluation estimated that 62,000 forms, enumerating 140,000 persons, were received. Of these, 71,000 were added to the census after unduplication. In 1990, the Census Bureau received about 352,800 forms, from which about 260,000 persons were added to the census.

¹³⁴ For more information, see Nathan Carter, “Be Counted Campaign for Census 2000: Final Report,” Census 2000 Evaluation No. A.3., September 25, 2002.

¹³⁵ U.S. Census Bureau, “Regional Partnership Report: Portrait of America,” FLD/00-PR2, Washington, DC, March 2001, p. 18.

¹³⁶ *Ibid.*, p. 19.

The Census Bureau, in partnership with city and state employee groups, community and religious organizations, Complete Count Committees, homeless advocates and providers, public facilities, and schools, distributed informational and promotional materials aimed at reducing fear and mistrust of the government and its activities in hard-to-enumerate and urban areas.¹³⁷

Texas Colonias Special Initiative. The Census Bureau created the Texas Colonias Special Initiative in an attempt to increase participation among the linguistically isolated communities, known as “colonias,”¹³⁸ in Southeast Texas and New Mexico. The initiative worked with bilingual representatives from the colonias who were familiar with the living structures and language difficulties associated with the colonias. The initiative also sought to respond to the needs of the growing number of immigrants from Central and South America.

The Texas Colonias Special Initiative was conducted during Census 2000’s update/enumerate and update/leave operations. Organizers hired Spanish-speaking facilitators and enumerators and developed “fotonovelas” (Spanish picture books) that were distributed to colonia inhabitants to ease fears and mistrust of the government.¹³⁹

Central and South American Special Initiative. Between March and June 2000, in an effort to increase census participation among the Central and South American populations, the Census Bureau distributed informational and promotional materials addressing that population’s concerns about data confidentiality and severe mistrust of the government.¹⁴⁰

Urban and Rural American Indians and Alaska Natives Special Initiative. The Urban and Rural American Indians and Alaska Natives Special Initiative developed materials that reached, informed, and motivated American Indians and Alaska Natives who were not living on reservations and were neither participating in nor using American Indian/Alaska Native (AIAN) facilities or agencies.

Between February 25 and March 3, 2000, the Census Bureau (in conjunction with 50 partner organizations) produced and distributed posters and flyers and sponsored workshops that addressed AIAN concerns about data confidentiality and general mistrust of the government, confronted the problem of low levels of literacy among off-reservation AIAN populations, and explained the process of completing the questionnaire (with an emphasis on answering the race question and identifying an enrolled tribe).¹⁴¹

Minority Colleges/Universities and Pan-Hellenic Special Initiative. During the Minority Colleges/Universities and Pan-Hellenic Special Initiative, the Census Bureau sought to inform and motivate students of minority colleges and universities as well as faculty and members of eight national Pan-Hellenic organizations (data indicated approximately 2 million college-educated African Americans affiliated with these fraternities and sororities in the Charlotte, NC, and Atlanta, GA, regions) to participate in the census and encourage others to do so. The Census Bureau reached these populations through community advocacy, various broadcast media, promotional products, and program and curriculum development between March and June 2000.¹⁴²

¹³⁷ Ibid., p. 18.

¹³⁸ “Colonia” is a Spanish term for neighborhood or community. In Texas, “colonia” refers to a residential area along the Texas-Mexico border that may lack basic water and sewer systems, electricity, paved roads, and safe and sanitary housing. Colonias can be found in Texas, New Mexico, Arizona, and California, but Texas has both the largest number of colonias and the largest colonia population. Approximately 400,000 Texans live in colonias. Overall, the colonia population is predominately Hispanic; 64.4 percent of all colonia residents and 85 percent of those residents under 18 were born in the United States. There are more than 1,400 Texas colonias, located primarily along the state’s 1,248 mile border with Mexico.

¹³⁹ U.S. Census Bureau, “Regional Partnership Report: Portrait of America,” FLD/00-PR2, Washington, DC, March 2001, p. 18.

¹⁴⁰ Ibid.

¹⁴¹ Ibid., p. 21.

¹⁴² Ibid.

Joint Disability Special Initiative. The Census Bureau's Joint Disability Special Initiative was implemented, through a number of national, regional, and local partners,¹⁴³ to educate and motivate noninstitutionalized disabled persons in the Philadelphia, PA, region and the visually impaired in the New York, NY, region between January 24 and June 30, 2000. The Census Bureau and its partners developed posters and postcards as well as Braille questionnaire assistance guides that targeted the disabled and visually impaired. This initiative served as a prototype for similar initiatives implemented in Pennsylvania, Delaware, Maryland, New Jersey, and New York.¹⁴⁴

New York City Metro Transit Authority Special Initiative. To motivate residents and commuters in the New York City area, the Census Bureau and Metropolitan Transportation Authority reproduced Census 2000 placards and posters for placement in approximately 4,500 buses and 3,600 subway cars between March 15 and May 15, 2000.¹⁴⁵

African and Caribbean Immigrant Special Initiative. Through a partnership with approximately 450 local affiliates of national African and Caribbean organizations, the Census Bureau developed informational, instructional, and promotional materials along with motivational and confidentiality messages in African and Caribbean languages (Ahmari, Creole, French, and Ghanian). These materials were distributed between March and July 2000.¹⁴⁶

Joint Partnership Special Initiative on Arab Populations. Partnering with national and local organizations, the Census Bureau developed materials that emphasized the civic responsibility of partnerships in the census and attempted to reduce mistrust of government and ease fears about identifying ethnicity within the Arab immigrant population.

In a three-tiered approach to identifying Middle Eastern partners, the process began with an informational letter that was distributed to more than 1,200 Middle Eastern organizations in the Detroit, Los Angeles, Dallas, New York, and Philadelphia metropolitan areas. Those responding to the letter became candidates to be national and state partners. Finally, Middle Eastern media outlets in these regions received radio and television public service announcements, informational literature, and promotional products.

The initiative on Arab populations was conducted between March and July 2000. Materials were distributed in five languages—Arabic, Armenian, Assyrian, Chaldean, and Syriac.¹⁴⁷

Joint Language Diversity Partnership Special Initiative. The Census Bureau's Joint Language Diversity Partnership Special Initiative targeted audiences in the New York and Los Angeles regions for whom no other outreach efforts existed. It served as the template for other regions to use to reach similar populations.

Approximately 27 languages were represented by this special initiative that assisted populations, through adult education services, cultural programs, the media, and the like, between March and June 2000.¹⁴⁸

Faith-Based Program Support Plan Special Initiative. The Faith-Based Program Support Plan Special Initiative developed and distributed promotional items for religious organizations and other places of worship in support of Census Sabbath¹⁴⁹ and other congregational activities.

¹⁴³ Partner organizations for the Joint Disabilities Special Initiative included the American Association for People With Disabilities; American Council for the Blind; Braille Institute; Lighthouse, Inc.; Lions Club; and National Parent Network on Disabilities.

¹⁴⁴ U.S. Census Bureau, "Regional Partnership Report: Portrait of America," FLD/00-PR2, Washington, DC, March 2001, p. 20.

¹⁴⁵ Ibid., p. 18.

¹⁴⁶ Ibid.

¹⁴⁷ Ibid.

¹⁴⁸ Ibid., p. 21.

¹⁴⁹ Census Sabbath, conducted March 24 to 26, 2000, was an opportunity for congregations to motivate members to participate in Census 2000 and offer help to those needing assistance with their questionnaires.

Thirty-eight national religious organizations, comprising more than 500,000 faith-based organizations, participated in the Faith-Based Support Plan Special Initiative between March and June 2000.¹⁵⁰

Operation RESPOND Special Initiative. This initiative provided support to Complete Count Committees in the Chicago region to fully implement Operation RESPOND (Reaching Every Single Person on the Nation's Decennial) as a means of raising the mail response rate throughout the three states of Illinois, Indiana, and Wisconsin.¹⁵¹

Support for Partners

The Census 2000 Publicity Office developed a wide variety of support materials for partners, including fact sheets, manuals, posters, videos, newsletters, drop-in news articles, and promotional items.¹⁵²

In-Kind Support

In-kind contributions supported census outreach and promotion efforts with such partners as Complete Count Committees, religious organizations, schools, local and tribal governments, and various community-based organizations.¹⁵³ While the Census Bureau was prohibited from providing direct cash subsidies to its partners, the agency did contribute rented office space, office supplies and equipment, and local media buys in support of the partnership effort. Partner organizations were encouraged to provide similar contributions, including paying for staff time donated by the partners' employees. Partner organizations' in-kind contributions to the Census 2000 Partnership Program were estimated to be worth about \$500 million.¹⁵⁴

Thank You Campaign

The Partnership and Data Services headquarters staff coordinated the Census 2000 Thank You Campaign. For the most part, this campaign consisted of approximately 200,000 thank you certificates and a letter from Census Bureau Director Kenneth Prewitt thanking everyone who had participated in making Census 2000 a great success.

Thank you certificates were hand-delivered to many national organizations and companies who made large contributions to the partnership program through their efforts during the census. In addition, regional offices carried out their own thank you campaigns to thank local partners personally for their contributions to a successful Census 2000.¹⁵⁵

Partnership Program Results

The Census Bureau believes that all the efforts introduced during Census 2000, including the Census 2000 Partnership Program, helped to reverse the downward trend of mail response rates. Additionally, the agency has concluded that these programs contributed to reducing the differential undercount in 2000 from 1990 census levels for all historically undercounted population groups (African Americans, Hispanics, Asians, and American Indians). It is hoped that the impact of these actions will be felt in future censuses and surveys.¹⁵⁶

¹⁵⁰ U.S. Census Bureau, "Regional Partnership Report: Portrait of America," FLD/00-PR2, Washington, DC, March 2001, p. 44.

¹⁵¹ Ibid., p. 15.

¹⁵² Marvin D. Raines, "Partnership Program for Census 2000," presentation for an international trip to South Africa, July 2001, p. 14.

¹⁵³ Ibid., pp. 14–15.

¹⁵⁴ Ibid., p. 14. See also, "Census Ads Hit Broad Target," *Adtrack (USA Today and Harris Interactive)*, April 24, 2000.

¹⁵⁵ Ibid., p. 15.

¹⁵⁶ Ibid., p. 16.

Impact of the Partnership Program

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.¹⁵⁷

The Census 2000 Partnership Program 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.¹⁵⁸

Partnership Program Evaluations

Evaluation of the Census 2000 Partnership and Marketing Campaign. The Census Bureau hired the National Opinion Research Center (NORC) to evaluate the Census 2000 Partnership and Marketing Program by conducting surveys before, during, and after the partnership and paid advertising campaigns had been launched.

The surveys were by telephone and in-person interviews and were oversampled for historically undercounted populations. The survey sample included 10,000 individuals and was conducted during three phases: (1) preadvertising campaign (October to November 1999); (2) during the advertising campaign, prior to mailout (January to March 2000); and (3) during nonresponse follow-up (April to May 2000).¹⁵⁹ Interviews were conducted with the person in each household who generally opened the mail or would have most likely answered the census questionnaire.

The NORC concluded that the Census 2000 Partnership and Marketing Program was generally successful in promoting awareness and intent to participate in the census. NORC also concluded that the program had a limited impact on actual behavior. Nevertheless, NORC recommended that a similar mass media and community-based program be repeated (with some modifications) in 2010.¹⁶⁰

Evaluation of the Survey of Partners. A separate Survey of Partners considered such things as the helpfulness of Census 2000 materials distributed to partners, the types and value of services rendered, and the specific partnership activities conducted.

Data for the evaluation of partners were collected through a self-administered mail survey with a telephone follow-up to a sample consisting of 15,000 organizational partners within federal, state, local, and tribal governments; nongovernmental organizations; media outlets; and businesses.¹⁶¹

RESULTS OF THE CENSUS 2000 PARTNERSHIP AND MARKETING PROGRAM

As noted earlier, the Census Bureau’s goal to halt the decline of the mailback response rate was not only met for Census 2000, it was surpassed. 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 in 1990 to 67 percent in 2000.¹⁶² More specifically, 13 of the nation’s 15 most populous cities

¹⁵⁷ The numbers of national, state, and local organizations participating in Census 2000 partnerships were as follows: 42,571 community organizations; 32,632 state and local governments; 23,055 businesses; 17,519 religious organizations; 17,375 educational organizations; 1,038 tribal governments; and 6,892 media organizations. See U.S. Census Bureau, “Census 2000 Partnership Debriefing Report: 1996–2000,” June 2001, p. 2.

¹⁵⁸ For more information, see Marvin D. Raines, “Partnership Program for Census 2000,” presentation for an international trip to South Africa, July 2001, p. 17.

¹⁵⁹ *Ibid.*, p. 18.

¹⁶⁰ National Opinion Research Center, “Partnership and Marketing Program Evaluation: Final Report,” July 17, 2002.

¹⁶¹ Marvin D. Raines, “Partnership Program for Census 2000,” presentation for an international trip to South Africa, July 2001, p. 18.

¹⁶² The final national mail response rate was defined as the percentage of housing units that mailed back their questionnaires, filed them over the Internet, completed the form by telephone, or returned a Be Counted form from a Questionnaire Assistance Center, as of December 31, 2000.

equaled or exceeded their 1990 response rates. Fourteen of the 15 most populous counties did the same. Five states and nearly 9,300 other governmental units even surpassed the mark by meeting a Census Bureau challenge to better their 1990 response rates by five or more percentage points.

In addition to the collection of more accurate statistical data as a result of the Census 2000 Partnership and Marketing Program (PMP), field operations also were completed early or on time and for less money than had been budgeted. At the conclusion of Census 2000 operations, a \$305 million surplus was returned to the U.S. Department of Treasury.¹⁶³

Effectiveness of the Integrated Marketing Strategy

By most accounts, Census 2000 was a success. The mail return rate¹⁶⁴ was 74.1 percent, almost identical to that of the 1990 Census, thus ending the declining trend established between 1970 and 1990. The final mail response rate, which includes all mail returns through the end of the year, was 67 percent, well above the expected rate of 61 percent. The nonresponse follow-up effort finished almost 2 weeks ahead of schedule. Finally, in 1990 the net undercount of the U.S. population was estimated at 1.6 percent overall and up to 5 percent for various racial and ethnic groups.¹⁶⁵ Estimates of net coverage for Census 2000 ranged from an overcount of 0.49 percent to an undercount of 0.12 percent. No statistically significant undercount of a racial or ethnic group exceeded 2 percent.¹⁶⁶

PMP evaluation studies were intended to measure the effectiveness of PMP components and activities—to try to attribute the contribution of each to the relative success of Census 2000. The evaluation analysis strategy relied on a simple behavioral model underlying the Young & Rubicam advertising strategy: in order to participate, individuals must first be aware of Census 2000, must have positive attitudes about it, and must be motivated to fill out the Census 2000 form. Attitudes and motivation, in turn, are a function of the information individuals have about the decennial census. The PMP attempted to convey the right message, to the right people, at the right time to convince them to respond to the census.¹⁶⁷

Following the evaluation of the campaign, the Census Bureau drew the following conclusions:¹⁶⁸

- The mandatory notice on the questionnaire's outer envelope had a positive effect on return rates.
- The Census 2000 Partnership Program and the Census in Schools program were relatively successful in reaching out to hard-to-enumerate populations. This was evidenced by the kinds of constituencies active partners reported in the Survey of Partners and by the levels of awareness and use of materials reported in the Census in Schools evaluation survey, although quantifying the program's impact in terms of numbers of individuals reached or increases in participation rates was not possible.
- The campaign dramatically increased awareness of the census among the general population and among certain traditionally hard-to-enumerate race and ethnic groups.
- Print media coverage of Census 2000 was much broader nationally than in 1990 and probably more positive in tone overall.

¹⁶³ U.S. Census Bureau News, "Census 2000 Efficiencies Result in \$305 Million Savings," Press Release CB00-CN.58, September 27, 2000.

¹⁶⁴ A mail return rate is defined as the number of mail returns received before the cutoff date (April 18) for nonresponse follow-up divided by the number of occupied housing units in mailback areas.

¹⁶⁵ W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), p. 5.

¹⁶⁶ The Accuracy and Coverage Evaluation (A.C.E.) Revision II is the source of the overcount estimate, while the 0.12 percent undercount estimate comes from demographic analysis. See U.S. Census Bureau, "Technical Assessment of A.C.E. Revision II," March 12, 2003. For a more detailed description of these estimates, see Chapter 10, "Testing, Experimentation, Evaluation, and Coverage Measurement Programs."

¹⁶⁷ W. Sherman Edwards and Michael J. Wilson, *Evaluations of the Census 2000 Partnership and Marketing Program*, Topic Report No. 6, TR-6 (Washington, DC: U.S. Census Bureau, 2004), p. 7.

¹⁶⁸ *Ibid.*, pp. 7–8.

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- Positive attitudes toward the census seemed to increase with participation. The association varied somewhat by race and ethnic group.

The following statements were indirectly supported by the evaluation data or other research as compiled in *Evaluations of the Census 2000 Partnership and Marketing Program*.¹⁶⁹

- Politicians quoted as saying that the long form was an invasion of privacy may have negatively affected return rates for the long form.
- The advance letter probably positively affected response rates.
- The respondent-friendly questionnaire design likely had a positive effect. This effect might have been greater in hard-to-enumerate areas.
- Receipt of the mailout package, particularly the long form, might have increased negative beliefs about the census.
- For the first time in census history, the mail response rate increased over the previous census, from 65 to 67 percent.

At its conclusion, the Census 2000 advertising campaign was ranked as the second most effective campaign of the year according to AdTrack, a *USA Today* consumer poll. The campaign was ranked 53rd in spending among all advertisers for the first half of 2000.¹⁷⁰

InterSurvey/Census Bureau Analysis

Between March 3 and April 13, 2000, Intersurvey surveyed 4,673 households to assess exposure to Census 2000 through advertising, community mobilization, and news stories.¹⁷¹

Intersurvey conducted a second survey, consisting of 1,993 households, during the first week of April 2000 to measure the extent to which the debate over the Census 2000 long-form questionnaire influenced participation.

The Intersurvey evaluation found that:

- Census 2000's promotion and mobilization campaign substantially increased public awareness and knowledge of, and participation in, the census.
- The campaign was particularly effective in the African American and Hispanic communities, as well as in households receiving long-form questionnaires.
- Growing privacy concerns appeared to have had a negative impact on cooperation. Nevertheless, even among those who believed the census was a violation of privacy, people with higher levels of exposure to the Census 2000 marketing campaign were more likely to participate than those concerned about privacy but with a lower level of exposure.
- Public awareness of the controversy over the Census 2000 long-form questionnaire was widespread and may have had an impact on participation.
- Questions on the long-form questionnaire concerning income and physical and mental disabilities were ranked most highly as being too personal for the census to ask, though one-third of the public said that none of the questions on the questionnaire was too personal to ask.¹⁷²

Government Accountability Office's Report

In a report to congressional committees, the U.S. Government Accountability Office (GAO) noted that the Census Bureau's aggressive partnership and marketing campaign was key to the success of Census 2000. Furthermore, according to the GAO, the campaign enabled the Census Bureau to

¹⁶⁹ Ibid., pp. 27–28.

¹⁷⁰ "Census Ads Hit Broad Target," Adtrack (*USA Today* and Harris Interactive), April 24, 2000.

¹⁷¹ Intersurvey, "America's Experience with Census 2000: A Preliminary Report," undated.

¹⁷² Ibid.

complete nonresponse follow-up operations more quickly than anticipated because of the higher-than-expected initial mail response rates that reduced the follow-up workload and associated staff requirements and costs of a larger operation.¹⁷³

Gallup Organization/Institute of Social Research at the University of Michigan

The Gallup Organization and the Institute of Social Research at the University of Michigan gathered information on the public's attitudes regarding the census, its uses, trust and privacy issues, the Census Bureau's confidentiality practices, possible data sharing across federal agencies, and finally the willingness to provide social security numbers.

Gallup's telephone surveys of two samples of U.S. households before and after the April 1, 2000, Census Day included: (1) comparisons of the responses to those of similar 1995 and 1996 public surveys commissioned by the Census Bureau to assess long-term attitudinal trends; (2) comparisons between 1999 and 2000 responses examining potential effects the census environment might have had upon public attitudes; and (3) assessment of how exposure to census-related media, as reported by Census 2000 survey respondents, affected their responses. To determine whether attitudes toward the census could be used to predict propensity to respond, the survey requested respondents to provide their addresses. Relationships between respondents' attitudes, demographic information, exposure to census publicity, and response behavior were subsequently determined.

The results of the Gallup Organization's Survey of Privacy Attitudes in 2000 indicated that:

- The public steadily increased its knowledge and awareness of the census, its uses, and laws related to confidentiality practices between 1995 and 2000. The Census 2000 publicity seemed to enhance the public's knowledge of and willingness to cooperate with the census.
- The public's belief that the Census Bureau actually protects data confidentiality had increased, but that the public's trust that the Census Bureau would keep data confidential had not changed, suggesting that census publicity had little or no effect upon public attitudes toward confidentiality.
- There was a small, but statistically significant, decline between 1999 and 2000 in the public's privacy concerns in general. Long-term trends show small increases in public concerns about personal privacy and the loss of control over personal information. The proportion who viewed the census as an invasion of privacy did not change between 1999 and 2000.
- Relationships existed between Census 2000 survey respondents' attitudes and self-reported exposure to census-related media. Those exposed to both positive and negative media were more knowledgeable about the census, considered it more important, and were more likely to endorse an obligation to cooperate with the census than those with no media exposure.

As a result of this evaluation, Gallup and the Institute of Social Research jointly recommended further examination of public attitudes on privacy, confidentiality, and trust in the Census Bureau and more effective tests to address these issues in future publicity efforts.¹⁷⁴

Inspector General's Report

In a September 1999 report, the U.S. Department of Commerce, Office of Inspector General, issued a report following its audit that evaluated the Census Bureau's paid advertising campaign, as well as its partnership program plans, for increasing the mail response rate and reducing the undercount.

¹⁷³ U.S. Government Accountability Office, "2000 Census: Best Practices and Lessons Learned for More Cost-Effective Nonresponse Followup," report to congressional committees, GAO-02-196, February 2002.

¹⁷⁴ Susan Trentham, Laurie Larwood, and Kevin A. Shaw, *Synthesis of Results From the Social Security Number, Privacy Attitudes, and Notification Experiment*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report (Washington, DC: U.S. Census Bureau, 2003).

The inspector general's report noted that the paid advertising contractor had developed an advertising message that was consistent with the goal of the public awareness campaign. The message was thoroughly researched and tested and met the objectives stated in the contract. The report also noted that the partnership program implemented a comprehensive nationwide program directed at increasing the mail response rate and thereby reducing the undercount. In conclusion, the report "revealed no significant problems, contains no recommendations and requires no action by bureau officials."¹⁷⁵

Monitoring Board's Report

In an April 11, 2001, report to Congress, the Presidential members of the U.S. Census Monitoring Board, though troubled by the continued existence of a differential undercount, especially among minority populations, stated:

[The U.S. Census Bureau Monitoring Board members applaud] . . . the Bureau for the success of Census 2000 and believe that Congress should be pleased with the results of this \$7 billion endeavor. There is no dispute that the Bureau completed the nation's largest peacetime mobilization under budget and on time. Nearly one million persons were hired, 520 temporary local offices were established, an unprecedented paid advertising program was implemented, and more than 140,000 local and national partnerships were formed.¹⁷⁶

EXTERNAL RECOGNITION: AN AWARD-WINNING STRATEGY

Silver Anvil Award of Excellence (Public Relations Society of America)

In March 2001, the Public Relations Society of America selected 87 finalists, including the Census Bureau's How America Knows What America Needs campaign, for its Silver Anvil Competition. The Silver Anvil Competition is the public relations industry's premier awards program.

The Public Relations Society of America presented the Award of Excellence and the Bronze Anvil Award to the Census Bureau for the integrated marketing plan and for two of its components.

David Ogilvy Awards (Advertising Research Foundation)

Young & Rubicam and the Census Bureau were honored as the Grand Winner of the David Ogilvy Research Award for performing the most effective research of all candidates on behalf of the Census 2000 advertising campaign.

Effie Award (American Marketing Association)

The prestigious 2001 Gold Effie Award from the New York American Marketing Association went to Young & Rubicam. Their campaign ("Census 2000. This is your future. Don't leave it blank.") won in the category of government/institutional advertising.

The Effie, introduced by the New York American Marketing Association in 1968, is the only national award that honors creative achievement in meeting and exceeding stated advertising objectives. The results of the 1990 census revealed a significant national population undercount, which the Census Bureau concluded had occurred largely within the nation's multicultural and immigrant populations. Seeking to remedy this for Census 2000, Young & Rubicam developed advertising campaigns to educate and motivate a variety of population groups to participate in Census 2000.

¹⁷⁵ U.S. Department of Commerce, Office of Inspector General, "Public Awareness Campaign Is Meeting Program Objectives," Audit Report No. ESD-11755-9-0001, September 1999.

¹⁷⁶ "U.S. Census Monitoring Board, Presidential Members Report to Congress," April 11, 2001, p. 3.

Telly Awards

Video Zone, part of the Census Bureau's Public Information Office, received three Telly Awards for outstanding video production. The Telly Awards honor excellence in local, regional, and cable TV commercials, as well as nonbroadcast video and TV programming. The three winners produced to support Census 2000 were:

1. *Portrait of America*. Depicted the diversity of America and encouraged participation in Census 2000 as a civic responsibility.
2. *1790: The First Census*. Scenes from the National Archives exhibit on the first census, featuring Paul Revere's entry on the 1790 census schedule, with sound bites from the Census Bureau history staff and other historians.
3. *Science of Quality Counts*. National experts in statistical science explain how the Census Bureau collects and reports quality data. It includes sound bites from former Census Bureau Director Kenneth Prewitt and private-industry statisticians.¹⁷⁷

CONCLUSION

In a March 2001 statement before the Senate Committee on Commerce, Science, and Transportation, Secretary of Commerce Donald L. Evans testified that "the 2000 Census is the most accurate census this nation has ever conducted . . . Census 2000 was an operational success. The Census Bureau met or exceeded its goals . . . This success can be attributed to the Congress' commitment to providing full funding for a number of improvements, including unprecedented outreach programs to groups that historically had the highest undercounts."

Secretary Evans noted that the multimillion dollar advertising campaign, partnership efforts, Census in Schools program, and development of a user-friendly mailing strategy were responsible for significantly exceeding the expected mail response rate of 61 percent—reaching 65 percent by the start of nonresponse follow-up operations.¹⁷⁸

¹⁷⁷ U.S. Census Bureau, *Census CounterParts*, Vol. 10, No. 5, May 2001, p. 5.

¹⁷⁸ "Prepared statement of Honorable Donald L. Evans, Secretary of Commerce, before the Committee on Commerce, Science, and Transportation, U.S. Senate, March 28, 2001, pp. 1–4.

Chapter 5.

Data Collection

INTRODUCTION	215
ORGANIZATION	216
Regional Census Centers (RCCs)	216
Accuracy and Coverage Evaluation Regional Offices (ACEROs)	216
Field Offices	218
Census field offices (CFOs)	218
Early local census offices (ELCOs)	219
Local census offices (LCOs)	219
Pseudo-LCOs	220
Office Organization	221
Regional census centers	221
Local census offices	221
LOGISTICS	222
Management and Oversight	222
Census 2000 Logistics Tracking System	223
Leasing Office Space	223
Obtaining Furniture, Equipment, and Supplies	224
Supplies	225
Census Operational Kits	225
Administrative Forms and Operational Materials	225
Disposal of Excess	225
National Processing Center Support	225
FIELD SAFETY AND SECURITY	225
Regional Census Centers	226
Local Census Offices	226
Methods of Security	227
AUTOMATION INFRASTRUCTURE	228
Major Software Systems	228
Decennial Field Interface (DFI)	229
A.C.E. Automated Data Collection	231
Testing and Software Deployment	232
Field Technical Support	233
PERSONNEL	233
Exemptions	234
Development of a System of Competitive Pay Rates	236
Selection Process	236
Hiring	237
TRAINING	237
Management Training	238
Administrative Training	238
Field Training	238
MAIL CENSUS	239
Address Listing	239
Block Canvassing	240
Multiple Mailing Strategy	240
Questionnaire Assistance Centers (QACs)	240
Telephone Questionnaire Assistance (TQA)	242
Web Site Operations	243
Receiving Mail Returns	244
Undeliverable as Addressed (UAA)	244
Mail Response Rate and Return Rate	245
Mail response rate	245
Mail return rate	246

CONTENTS

ENUMERATION METHODS	247
Update/Leave (U/L)	247
Urban Update/Leave (UU/L)	247
Update/Enumerate (U/E)	248
List/Enumerate (L/E)	248
Field Follow-Up	249
NONRESPONSE FOLLOW-UP (NRFU)	249
Enumeration Procedures	250
Final Attempt	251
Review and Check-In	251
Special Data Collection Methods for Targeted Areas	252
Supplemental Campaigns	253
“Be Counted” campaign	253
POP 99	253
Residual nonresponse follow-up (R-NRFU)	253
QUALITY ASSURANCE	254
Reenumeration in Hialeah, Florida	256
SPECIALIZED ENUMERATION PROCEDURES	256
Remote Alaska Enumeration	256
Overseas Counts Program	257
Congressional Enumeration	258
Island Areas	258
GROUP QUARTERS ENUMERATION	258
Special Place Facility Questionnaire Operation	259
Military/Maritime/Military Vessels Enumeration	259
Service-Based Enumeration (SBE)	260
Transient Night (T-Night) Operation	262
COVERAGE IMPROVEMENT	262
Census 2000 Operations to Reduce Undercount	263
Enumeration Baseline	263
Coverage Edit Follow-Up (CEFU)	263
Conducting CEFU Interviews	264
Coverage Improvement Follow-Up (CIFU)	265
CIFU data collection process	266
CIFU quality assurance program	266
ACCURACY AND COVERAGE EVALUATION (A.C.E.)	267
CLOSEOUT	268

Chapter 5: Data Collection

INTRODUCTION

Touted by Secretary of Commerce William Daley as “the largest peacetime mobilization in our nation’s history,” Census 2000 presented the Census Bureau with monumental operational and scientific challenges.¹ Since the United States’ inception in 1787, the nation has continued to grow, and its population has become increasingly diverse. With continued innovation in communications and transportation, technological sophistication has brought complexity as well as convenience to modern life. Throughout U.S. history, however, the fundamental mission of the Census Bureau remains unchanged. The Constitution requires conducting a census every 10 years—the first of these decennial censuses took place in 1790—to determine the apportionment of the seats in the House of Representatives.² Subsequent censuses required delivery of state population counts to the President by December 31 of the census year. By 2000, in addition to its constitutional obligations, the Census Bureau was legally required to provide small-area population data to the legislatures and governors of each state for use in redistricting.³ In order to meet the mounting challenges involved in providing a complete and accurate count of over 281 million residents within 9 months, the Census Bureau implemented an operational plan of which the most expansive and labor-intensive component was field enumeration, more commonly known as the “data collection phase” of census operations.

The Census Bureau used four primary methodologies to collect census data: mailout/mailback, update/leave, update/enumerate, and list/enumerate. The U.S. Postal Service delivered over 92 million Census 2000 questionnaires to approximately 83 percent of the nation’s residences. Respondents were instructed to complete the form and return it by mail. In addition to the questionnaires used in mailout/mailback areas, Census Bureau enumerators personally delivered approximately 22 million questionnaires to homes that did not have house-number, street-name addresses (mostly in rural and remote areas), which represented about 17 percent of the nation’s housing units.⁴ During the update/leave operation used primarily in rural areas, questionnaires with preprinted address labels were hand-delivered to every housing unit on the address list. Existing housing units not listed on the address register also required questionnaires, but these were hand-addressed and added to the address register by the enumerators. For update/enumerate, staff updated the address list and maps during their enumeration rounds in areas where housing units may not have had city-style mailing addresses. Census 2000’s list/enumerate methodology was an all-in-one operation used in sparsely populated areas of the country, including remote Alaskan villages. During this operation, census enumerators canvassed their assigned areas listing addresses within those areas on blank address register pages, locating the addresses on census maps (map spotting), and conducting interviews to collect census information for each address.

The objective of Census 2000 nonresponse follow-up was to obtain completed questionnaires from households in the mailback areas that had not responded by mail, the Internet, or via a Telephone Questionnaire Assistance interview. As the largest and most expensive phase of Census

¹ U.S. Census Bureau, Decennial Media Relations, “Census Bureau Begins to Recruit Hundreds of Thousands of Workers for Census 2000,” *U.S. Census Bureau News*, Press Release CB00-CN.02, January 5, 2000, available online at <http://www.census.gov/Press-Release/www/releases/archives/census_2000/000624.html>. Accessed August 3, 2005.

² It should be noted that while Article 1, Section 2 of the U.S. Constitution requires that a census be conducted, early censuses were conducted by U.S. marshals initially under the direction of the Secretary of State and later of the Secretary of the Interior. It was not until 1902 that the Census Bureau was established as a permanent institution by an act of Congress.

³ See Public Law 94-171, December 23, 1975.

⁴ “Nearly 100 Million Census 2000 Questionnaires in the Mail, Census Workers Delivering the Rest,” *U.S. Census Bureau News*, Press Release CB00-CN.24, March 13, 2000.

2000 operations, the nonresponse follow-up workload contained 42,372,965 housing units representing 35.6 percent of the 119,090,016 housing units in mailback areas eligible for follow-up. During nonresponse follow-up an enumerator interviewed one or more of the members of each household or a knowledgeable proxy respondent to gather information.

To meet the challenges presented by data collection and its requisite quality assurance programs, the Census Bureau built an expansive nationwide infrastructure. Field enumeration required the coordination of 12 regional census centers responsible for overseeing the activities conducted at 520 local census offices and a variety of Be Counted and Questionnaire Assistance Centers.

ORGANIZATION

Census 2000 data collection was the responsibility of the U.S. Census Bureau's Field Division (FLD). The FLD established a hierarchy of offices that were responsible for activities in smaller geographic areas. The FLD delegated tasks to its regional offices, regional census centers, census field offices, local census offices, Accuracy and Coverage Evaluation regional offices, and numerous Be Counted and Questionnaire Assistance Centers located throughout the United States.⁵

Regional Census Centers (RCCs)

To administer the decennial census, the Census Bureau established 12 regional census centers (RCCs) that were separate from the Census Bureau's 12 permanent regional offices (ROs). RCCs were located in Atlanta, Boston, Charlotte, Chicago, Dallas, Denver, Detroit, Kansas City, Los Angeles, New York, Philadelphia, and Seattle (Figure 5-1). These offices, each of which maintained a staff of approximately 135 employees (some of which were from the permanent ROs), were responsible for managing all census field collection operations and address listing through a network of census field offices and local census offices. RCCs also produced address maps and coordinated the Local Update of Census Addresses (LUCA) program.

The regional director headed both the RO and the corresponding RCC. While RO jurisdictions regularly crossed state boundaries in order to serve broad metropolitan areas—except for California, New Jersey, and New York, which were split along county lines—RCC jurisdictions were confined to whole states. Some precensus operations required an RCC to work with agencies that served areas outside the area assigned to it; for these programs, and in agreement with other affected RCCs, the official RCC boundaries were ignored (also see the section below regarding pseudo-LCOs). For Census 2000, responsibility for data collection in Puerto Rico was transferred from the New York RCC to the Boston RCC.⁶

The RCCs officially opened between December 1997 and March 1998. The FLD closed the RCCs as they completed their Census 2000-related map production operations. The process lasted from early September 2001 through early January 2002. When they completed their tasks, permanent Census Bureau staff members who had been assigned to an RCC returned to their respective work units. However, some RCCs retained part of their space for geographic operations, for clean up of residual geographic problems, and for work on Count Question Resolution. The latter activities continued well into 2003.⁷

Accuracy and Coverage Evaluation Regional Offices (ACEROs)

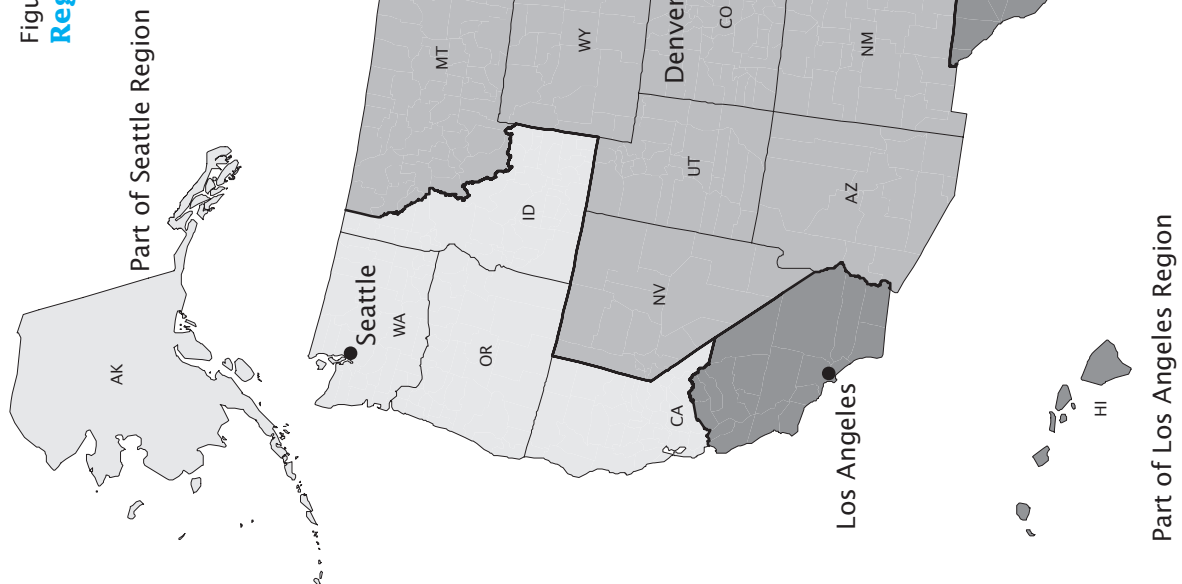
An expansion of field operations for Census 2000 included Accuracy and Coverage Evaluation regional offices (ACEROs). Tasked with completing the necessary data collection for the independent post-enumeration survey, called the Accuracy and Coverage Evaluation (A.C.E.), ACEROs, though independent offices, worked and shared some administrative functions with the RCCs and

⁵ U.S. Department of Commerce, "Census 2000 Operational Plan," DMD/01-1419, December 2000, p. VIII-3.

⁶ Data collection for the U.S. Virgin Islands and the three Pacific island areas (American Samoa, Guam, and the Northern Mariana Islands) was the responsibility of the Decennial Management Division (DMD). For more information on data collection in the Island Areas and Puerto Rico, see Chapter 12, "Puerto Rico and the Island Areas."

⁷ U.S. Census Bureau, "Census 2000 Operational Plan," DMD/01-1419, December 2000, p. VIII-1.

Figure 5-1.



were responsible for the same geographic and operations areas. Unlike RCCs, however, data collection efforts conducted by ACEROs were designed to evaluate the overall accuracy and completeness of Census 2000 by measuring the net undercount of the census.⁸

Field Offices

The Census Bureau established three types of offices—census field offices, early local census offices, and local census offices—to undertake several large-scale operations for Census 2000. In addition to these offices, the census of Puerto Rico was managed by a local area office that reported to the Boston RCC, and the census of each of the four major Island Areas was conducted by their governments and reported to Census Bureau headquarters. The FLD delineated, numbered, and entered the geographic coverage of the various offices into the Topologically Integrated Geographic Encoding and Referencing (TIGER®) database.

The TIGER® database contains geographical data on such items as streets, water features, governmental unit boundaries, and census blocks. This database was used to create customized maps used by enumerators, to assign the city-style addresses in the master address file (MAF) to specific census blocks, and to group census blocks into field assignment areas and data tabulation units.

Census field offices (CFOs). The Census Bureau established 402 CFOs—including 24 in Puerto Rico alone—for Census 2000. These small temporary offices, usually occupying about 500 square feet, typically consisted of four employees. CFOs were responsible for the address listing operation performed in areas where living quarters generally did not use house-number, street-name mailing addresses.

Like RCCs, CFOs could cross jurisdictional boundaries. In fact, most CFOs consisted of groups of whole counties. However, a few counties with large workloads⁹ were shared by two CFOs. Of course, a CFO covered only the portion of a county that was address-listed; of the 2,940 U.S. counties that contained types of enumeration areas (TEAs) 2 and 9 (see below), only 898 were listed in their entirety.

Types of Enumeration Areas (TEAs)*

TEA	Enumeration method used	TEA	Enumeration method used
1	Mailout/mailback	6	Military
2	Update/leave	7	Urban update/leave
3	List/enumerate	8	Urban update/enumerate
4	Remote Alaska	9	Additions to update/leave block universe
5	Rural update/enumerate		

*The TIGER® system used the designation “TEAb” to indicate blocks consisting of water area only.

In addition, all 78 municipios in Puerto Rico were listed in their entirety. However, the 11 counties in South Carolina and 1 in Wisconsin listed for the Census 2000 Dress Rehearsal, and the 39 counties listed for the American Community Survey (ACS) test that took place in 1999, were not listed again during the address listing operation, so they were not included in any CFO. CFOs had no geographic or numeric relationship to the subsequent field offices. They were related to their appropriate RCCs by using the RO geographic code plus 30 as a numeric prefix. Initially 402 CFOs were opened between June and September of 1998 to support address listing; these CFOs closed

⁸ U.S. Census Bureau, “Accuracy and Coverage Evaluation of Census 2000: Design and Methodology,” DSSD/03-DM, September 2004, pp. 1-1-6; U.S. Census Bureau, “Local Census Office Manager’s Handbook,” August 16, 1999, pp. 11-61-11-63. For more detail on the A.C.E. and other evaluations of Census 2000, see Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

⁹ The “workload” for a given office was determined by the number of housing units for which that office was responsible for enumeration and other ancillary activities.

in January 1999. An additional 92 urban CFOs were opened between December 1998 and March 1999 to support block canvassing; they were closed in July 1999.¹⁰

Early local census offices (ELCOs). These large temporary offices—about 6,000 to 7,000 square feet—were responsible for conducting some early Census 2000 activities and for establishing a presence in the community. Such early activities included the completion of block canvassing operations to ensure the quality of the MAF for mailout/mailback (MO/MB) areas. ELCOs conducted Waves 3 and 4 of the block canvassing operation and, later, the LUCA Field Verification; both of these took place only in MO/MB areas.

The RCCs delineated 130 ELCOs for the 50 states and the District of Columbia. Most ELCOs covered the TEA 1 portion of one or more counties; however, a few counties with large workloads were shared by two or more ELCOs. Each ELCO was assigned a unique 4-digit code; the first two digits were the standard RCC code, followed by consecutive numbers for the ELCOs, beginning with [XX]01. The first ELCO was opened on October 1, 1998, and the last conversion to an LCO took place in late October 1999.

Local census offices (LCOs). By Census Day (April 1, 2000) the Census Bureau had opened 520 LCOs nationwide. These large temporary offices were responsible for the data collection operations for the census, including update/leave (U/L), update/enumerate (U/E), list/enumerate (L/E), urban update/leave (UU/L), special place and service-based enumeration, nonresponse follow-up (NRFU), and coverage improvement follow-up. The average LCO employed approximately 60 office employees and a large dispersed field staff. Field staffing per office ranged from 600 to 1,000 enumerators based on LCO workload. Each enumerator was assigned an area and a list of addresses to visit during NRFU. Enumerators provided daily progress reports to their crew leaders.¹¹

Most LCOs covered a group of whole counties; however, some highly populated counties were divided into two or more LCOs because of the size of the workload. One LCO covered the Navajo Nation. The FLD established the boundaries of all LCOs in late June 1999, just before the scheduled opening of the first LCO. Census 2000 LCOs were the first Census Bureau field offices that could print their own maps, and the first operation for which they did so was U/L.¹²

Early Census 2000 planning called for a census that incorporated sampling and estimation, along with traditional census-taking methods, to provide its official counts. This plan established boundaries for 467 LCOs in the United States, plus 9 in Puerto Rico. In January 1999, the U.S. Supreme Court ruling against the use of sampling for producing the apportionment count prompted the Census Bureau to revise its plans.¹³ Replacing this plan with one that relied solely on traditional census-taking methods necessitated substantial changes in agency plans. In mid-1999, the Census Bureau redrew the LCO boundaries to establish offices located stateside and in Puerto Rico and the Island Areas, for a total of 520 LCOs. The FLD completed redelineation of the LCOs and gave final approval to the plans reflected in the TIGER® database on June 25, 1999. The FLD assigned each LCO a unique 4-digit code. Like the ELCO codes, the first two digits of an LCO code were the standard RCC code, followed by consecutive numbers for the LCOs, beginning with [XX]01.

The organizational structure of Census 2000 called for six types of LCOs. Each of these was designed to address the specific characteristics of a particular geography type, mail delivery system, and rural- or urban-style addresses, as well as the particular requirements of accurately enumerating widely varying communities. LCOs occupied office space ranging from 6,500 to 10,000

¹⁰ U.S. Department of Commerce, Office of Inspector General, “Bureau of the Census: Local Census Offices Were Successfully Opened, but Some Lessons Can be Learned from Decennial Leasing Operations,” Final Inspection Report No. IPE-11573, September 2000, p. 5; U.S. Census Bureau, “Census 2000 Operational Plan,” DMD/01-1419, December 2000, pp. VIII-1–3. For more information on address listing, see Chapter 8, “Addresses and Questionnaire Printing and Mailing.”

¹¹ On average, a crew leader was responsible for 16 enumerators.

¹² CFOs and ELCOs could not print maps. RCCs provided these offices with the necessary maps.

¹³ For more information on the debate over the use of sampling in Census 2000, see Chapter 11, “Legal Issues.”

square feet, and the types of LCOs varied by the number of housing units for which each was responsible and also by methods of enumerating the population.¹⁴

- **Type A** LCOs were located in inner-city urban areas (TEAs 1, 6, and 7 only) and were responsible for the enumeration of between 121,000 and 285,000 housing units (HUs). Considered by the FLD to be the most difficult of areas to enumerate, Type A LCO enumeration was accomplished primarily through MO/MB. There were, however, small areas enumerated through UU/L.
- **Type B** LCOs were located in urban metropolitan areas (TEAs 1, 6, and 7 only). Like Type A LCOs, Type B LCOs were responsible for some difficult-to-enumerate areas. For the most part, these areas were enumerated through MO/MB, although in some portions the UU/L method was used. These LCOs were responsible for between 300,000 and 335,000 HUs.
- **Type C** LCOs were located in small cities, towns, and rural areas (TEAs 1, 2, 5, 6, 7, 8, and 9). Representing a moderate, or average, challenge to enumerators, Type C LCO enumeration was completed largely through MO/MB and U/L, with some areas where U/E was used. These offices were responsible for between 316,000 and 325,000 HUs.
- **Type D** LCOs were located in more remote rural areas. While enumerators collected data primarily through U/L and L/E, some portions of Type D LCOs were completed through rural update/enumerate.
- **Type E** LCOs were assigned to Puerto Rico (TEA 2 only). Enumeration in Puerto Rico was conducted solely through U/L. These LCOs accounted for between 152,000 and 160,000 HUs. Data collected from Type E LCOs were handled by the RCC in Boston.
- **Type F**, the Anchorage LCO, had its own type designation due to the use of remote Alaska enumeration methodology, which was a modified L/E methodology. The remote procedures were used in the majority of Alaska, excluding southeast Alaska which was mainly completed using the regular L/E procedures.

The following criteria applied to the delineation of LCOs:

- Their boundaries were required to include and follow whole pseudo-tract boundaries.¹⁵ LCO boundaries could not cross state or regional boundaries.
- If appropriate for the type, their boundaries had to conform to the extent of the “blue line” (TEAs 1 and 9).¹⁶
- Each congressional district had to contain at least one LCO.
- LCO boundaries could not split an American Indian reservation (either federal or state) or off-reservation trust land, except where a state line or, for reservations with many widespread discontinuous parcels, a county line was involved (see section below on pseudo-LCOs).
- LCOs had to be geographically compact to the extent possible.
- All parts of an LCO had to be accessible without having to travel through another LCO.
- Office staff had to be able to access any point in the LCO in a “reasonable” amount of time; areal size could not exceed that of the similar type of local offices used for the 1990 census (the district offices, or DOs), enabling the RCCs to duplicate the 1990 DOs where feasible.

Pseudo-LCOs. In addition to the six types of LCOs, the Census Bureau also created administrative areas called “pseudo-LCOs” in order to satisfy two conflicting LCO requirements. It was both more efficient, and administratively more appropriate, for the Census Bureau to enumerate the

¹⁴ U.S. Census Bureau, “Local Census Office Manager’s Handbook,” August 16, 1999, Section D-506, p. 1-19–1-22.

¹⁵ “Pseudo-tracts,” also known as interim tracts, were the geographic boundaries and block numbering areas used in the 1990 census that, with some modification, were again used for Census 2000 operations. For more detail on pseudo-tracts, see Chapter 7, “Census Geography and the Geographic Support System.”

¹⁶ An area “inside the blue line” was one characterized by addresses having a house number, street name (or “city-style”) format. Such addresses were termed “inside the blue line” because blue pencil was used to circumscribe these areas when their boundaries were first drawn for the 1970 census.

land area (reservation and off-reservation trust land) under the authority of each American Indian tribe and the populated portion of each military base under the control of a single LCO. While LCO boundaries for Census 2000 were drawn so that most American Indian reservations and military installations were included within the boundaries of a single LCO, it was not always possible to satisfy these conditions. To resolve this problem, the agency created a pseudo-LCO and assigned a unique LCO code to those portions of land area belonging to either an American Indian reservation or a military installation that extended across state boundaries or were isolated parcels of land too widely dispersed to be included within the boundaries of a single LCO.

Where the area for a tribe or base would normally have been in more than one LCO, the Census Bureau assigned the appropriate territory to a pseudo-LCO and directed the responsible RCC to coordinate administrative activities for the area through one LCO.¹⁷ As a result, every tribe or military base was enumerated entirely by the one main LCO that contained its main area. This honored the Census Bureau's commitment to tribal governments to have each one deal with a single LCO and RCC. For military bases, this arrangement avoided overlaps when an LCO dealt with the military command regarding the enumeration of an on-base population. Census 2000 marked the introduction of pseudo-LCOs.

While pseudo-LCOs were not physical offices, they were part of the LCO coding infrastructure. To identify the special nature of the lands included in pseudo-LCOs, the Census Bureau assigned each pseudo-LCO a unique code whose first two digits were those of the RCC in which the pseudo-LCO was located and whose last two digits were 66 through 89—a range of numbers that allowed an RCC to have up to 24 pseudo-LCOs within its boundaries. The end result was that an LCO could be responsible for enumerating not only the area within its normal boundaries, but also one or more pseudo-LCOs that lay within the boundaries of another RCC and/or LCO. Conversely, some of an RCC's area could include pseudo-LCOs that were enumerated by other LCOs.¹⁸

Office Organization

Regional census centers. RCC staffing consisted of a team of managers, technicians, and other staff required to support LCO activities. Their tasks focused on these five major areas of support: the formation and management of partnerships with local governments, civic and religious groups, business communities, and fraternal, community, and charitable organizations; geographic support; recruiting; automation; and general administrative support. Under the supervision of the regional director and assistant regional census manager, partnership coordinators and partnership specialists established and maintained partnerships with local governments, media, and community organizations. Such partnerships were developed to promote community awareness of and participation in the census throughout the LCO community.

Working with automation technicians and a variety of computer and network specialists, RCC geographic coordinators and geographers provided LCOs with technical assistance on geographic issues such as MAF update and LUCA. In addition to technical assistance, RCC geographic specialists helped LCOs establish, organize, and maintain their map inventories; worked with the U.S. Postal Service to delineate TEAs; coordinated the New Construction program; and worked with the states on redistricting programs. Daily operational needs, such as telecommunications maintenance, human resources management, and clerical support were provided by an administrative supervisor and a number of administrative specialists. Area managers, with technical support from regional tech operations specialists, were responsible for the training and supervision of LCO managers.

Local census offices. The organization of LCOs was divided into five areas of responsibility: management; field operations; recruitment; administration and selection; and automation. The LCO manager, supported by three assistant managers and an automation technician, had ultimate

¹⁷ If the portion of a military base in question was known to be unpopulated, no pseudo-LCO was established.

¹⁸ The FLD delineated 39 pseudo-LCOs, assigned to 25 "parent" LCOs in 9 RCCs; 10 pseudo-LCOs crossed RCC boundaries, affecting 6 RCCs. U.S. Census Bureau, "Local Census Office Manager's Handbook," August 16, 1999, Section D-506, pp. 1-19-1-22.

responsibility for all operations performed by LCO staff, including monitoring the progress and cost of operations, meeting deadlines and data quality standards, and ensuring both the overall security and efficiency of the LCO. Under the supervision of the assistant manager for field operations, field activities were coordinated by field and office operations supervisors. These supervisors were responsible for training and supervising crew leaders who trained, monitored, and coordinated the activities of the enumerators. Enumerators were directly responsible for data collection in the field, visiting housing units and group quarters, and completing census questionnaires. Their efforts, along with other field operations, were supported by clerks responsible for preparing assignments, reviewing and checking in work from the field, and maintaining an inventory of supplies and training materials.

Recruitment for LCOs was the responsibility of the assistant manager for recruiting (AMR). Supported by assistants, clerks, and an office operations supervisor (OOS), the AMR was responsible for overseeing the recruiting and testing of all applicants for census operations. Administrative activities such as payroll, the interviewing and selection of staff, the processing of applications, the maintenance of office and training supplies, and other human resources duties were the responsibility of the assistant manager for administration (AMA) and his or her office operations supervisors and clerks.

LOGISTICS

For the first time since the 1970 census, the Census Bureau partnered with the U.S. General Services Administration (GSA) to lease space, acquire telecommunications services, and obtain much of the required office equipment and supplies for its Census 2000 offices. The Census Bureau and the GSA entered into an agreement, the Joint Venture 2000 partnership, through which the Census Bureau utilized the GSA's Public Buildings Service for space acquisition, its Federal Technology Service to obtain telecommunications services, and its Federal Supply Service to obtain supplies and furniture.

Before 1970, the Census Bureau leased its own space. In 1970, it enlisted the services of the GSA but was critical of the quality of some of the space the GSA obtained. Some offices were reportedly low-grade or were located in unsafe neighborhoods (though this was due partly to the uneven quality of available space at that time). As a result of that experience, the Census Bureau decided to conduct its own space acquisition for the 1980 and 1990 censuses. Due to delays in the Census 2000 budgetary allocations connected with the sampling debate, the Census Bureau was unable to meet its schedule in its leasing preparations. As a result, it was suggested that a partnership be formed between the Census Bureau and the GSA for Census 2000.¹⁹

This partnership was formed and performance measures developed with the involvement of the National Performance Review.²⁰ It allowed the Census Bureau to focus more on its primary mission and provided the GSA with an opportunity to demonstrate its service orientation to a major government client with special needs.

Management and Oversight

The logistics staff for Census 2000 was created by reassigning personnel from within the Census Bureau's Field Division (FLD) and other divisions. The Census Bureau established a Logistics Operation Center within the FLD to monitor, plan, and execute day-to-day logistical operations.

The Logistics Operation Center performed the following functions:

Planning

- Collected, evaluated, documented, and disseminated logistics information.

¹⁹ U.S. Department of Commerce, Office of Inspector General, "Bureau of the Census: Local Census Offices Were Successfully Opened, but Some Lessons Can Be Learned from Decennial Leasing Operations," Final Inspection Report No. IPE-11573, September 2000, pp. 3–4; U.S. Census Bureau, "Memorandum of Understanding, Census/GSA Partnership Project," February 17, 1998.

²⁰ The National Performance Review, later renamed the National Partnership for Reinventing Government, was the Clinton Administration's task force intended to reform major government functions through such initiatives as better customer service, employee empowerment, partnerships, interagency cooperation, and "reinvention."

-
- Tracked material and equipment resources.
 - Provided event-planning assistance.
 - Monitored and provided daily executive summaries of operations throughout the census.

Management

- Developed and implemented logistics procedures.
- Coordinated assistance requests and provided support via a help desk.
- Coordinated all aspects of opening and closing field offices, including scheduling and monitoring using the Census 2000 Logistics Tracking System (see below).
- Published guidance and procedures for RCCs to use during the opening and closing phases of census activities.

Operations

- Coordinated actions with the GSA, National Processing Center (NPC), vendors, and other field operations.

Providing logistical support for the decennial census was a monumental effort necessitating the integration of GSA support operations, equipment and furniture procurements, telecommunications, space acquisitions, internal staff coordination, and NPC operations.

The Logistics Operation Center worked with the GSA and the decennial field offices to track and monitor logistical support. Additionally, the center was the coordinating hub for GSA, NPC, local census office (LCO), census field office (CFO), regional census center (RCC), and headquarters staff for all logistical matters.

Census 2000 Logistics Tracking System

The Census 2000 Logistics Tracking System was a Web-based support tool designed to assist census managers in tracking tasks, materials, and equipment at census offices across the nation, from the offices' opening to shutdown of operations. The system used red, yellow, and green color-coded indicators to identify situations requiring specific management actions.

Included in the Census 2000 Logistics Tracking System was the Trouble Tracking and Reporting System. This system was designed to provide a central help desk to receive, record, and follow up on situations relating to equipment, automation, and supplies that could adversely impact field operations. Reports from the field, uploaded to the GSA on a daily basis, provided the GSA current status reports on facilities and telecom issues. The daily updates between the Census 2000 Logistics Tracking System and the GSA counterpart system ensured that the most current and accurate data were available for FLD management decisions.²¹

Leasing Office Space

The Census Bureau developed a plan to open offices sequentially and have them perform major Census 2000 functions from June 1, 1998, to December 31, 2000. The plan called for opening 520 early local census offices (ELCOs) and LCOs nationwide rather than the 476 offices necessary had sampling been used to complete the census. The opening of offices was completed in two phases, with 130 ELCOs opened by the end of fiscal year (FY) 1998 (Phase 1) and 390 LCOs opened by the end of FY 1999 (Phase 2). The first phase was operated as a trial run to ensure that the Census Bureau–GSA partnership would produce adequate leased space for the required 130 ELCOs within reasonable time and cost objectives. Deeming the first phase a success, the Census Bureau chose to continue the Joint Venture 2000 arrangement with the GSA by authorizing the second phase of leasing.

²¹ The Census 2000 Tracking System also was used to create logistics summaries for presentation to the Census Bureau's executive staff. U.S. Census Bureau, Decennial Logistics Staff, Field Division, "Census 2000 Decennial Logistics Final Report," May 2001, pp. 3–4.

Upon initiating the second phase of the leasing operation, the Census Bureau attempted to standardize the site survey process hoping to obtain leased space at consistently reasonable prices. The GSA first determined the availability of government-owned or already leased space that could be used for census offices. When government-controlled space was not available, the GSA and the Census Bureau jointly identified and acquired available privately owned space. In total, the Census Bureau–GSA partnership resulted in leasing 1,027 offices, totaling 4.5 million square feet of space, across all 50 states and Puerto Rico in support of Census 2000.

Twelve RCCs were opened by March 1998 in the continental U.S., as was an area office in Puerto Rico. Each RCC required a support staff of approximately 135 employees and 14,000 to 26,000 square feet of usable space. There were 494 CFOs opened by March 1999 and closed by August 1999. These offices required about 500 usable square feet of space for four employees. The 520 LCOs were scheduled to open in successive waves beginning in October 1998. Each office, with an office staff of 44, required between 7,000 and 8,500 usable square feet. The Anchorage LCO was the largest, with 10,000 square feet; this was necessitated by the large geographic area for which it was responsible. In addition, there were two supply depots in Juneau and Fairbanks of approximately 1,000 square feet each. The first group of ELCOs, delivered in Phase 1, were smaller—approximately 6,000 square feet; additional space had to be added during Phase 2. Phase 2 saw the scheduled opening of an additional 390 of the larger LCOs beginning in September 1999. Thirteen Accuracy and Coverage Evaluation regional offices (ACEROs) were added to the existing LCOs by September 1999. The ACEROs were approximately 12,000 square feet, while ELCOs were expanded to 7,000 to 8,500 square feet during Phase 2.

Obtaining Furniture, Equipment, and Supplies

The use of vendor-leased equipment and furniture for the LCOs was widely recognized as one of the best practices of Census 2000. Furniture for the 520 LCOs was leased through CORT Furniture, a national furniture-rental company. FLD's logistics staff specified furniture needs and requirements to CORT and the GSA, and CORT synchronized the delivery of furniture to coincide with the setup of the LCO office-automation equipment. The equipment vendor provided technical support and maintenance service throughout Census 2000.²² The following equipment was provided to the census offices:

Office type	Equipment received
Census field offices (CFOs)	Fax machine (1 each) Hand truck (1 each)
Local census offices (LCOs)	Fax machine ²³ (2 each) Photocopier (1 each)* Shredder (1 each) Typewriter (1 each) Postal meter (1 each) Hand truck (1 each)

*Initially, the LCOs received remanufactured photocopiers rated at 50,000 to 80,000 copies per month. As a result of higher than expected breakdown rates, selected LCOs were supplied with a second, new photocopier.

Over the 1-year operating time frame of the LCOs, the cost to rent furniture was nearly identical to the purchase cost. However, when the costs for purchasing and disposing of furniture were considered along with the time needed for administrative, procurement, and disposal activities, renting appeared to be the more advantageous option. At the conclusion of Census 2000 operations, pickup of the leased equipment and furniture was scheduled. This process was relatively quick and without incident, especially when compared with the disposition of government-owned material.

²² Generally, the leased equipment stood up well to the demands of most census operations. However, heavy workloads at peak periods put unexpected stress on copiers and shredders. As a result, the specifications for such equipment may need to be reviewed to determine if more or greater capacity is needed to support the offices in the future.

²³ Instead of business-use fax machines, the LCOs were supplied with lower capacity home-use fax machines. As a result, offices reported frequent problems requiring repair.

Supplies

The procedures for supply support called for the NPC to deliver prepackaged bulk supplies to each office when it opened. Resupply was accomplished by direct delivery from GSA's regional Customer Support Centers (CSCs). The GSA established individual census accounts within its Federal Supply System to support LCO supply requirements. Each LCO was given procedures and a specific listing of supplies it was authorized to order. LCOs requested resupply through their RCC which, in turn, placed the orders with the support CSC.

Census Operational Kits

Between November 1999 and May 2000, the Census Bureau conducted 19 different census operations that required the delivery of 295 different types of operation kits. For each census operation, FLD developed kit specifications that identified the materials to be included in each kit. FLD provided these requirements in a memorandum to NPC, which then keyed this information into its kit specification and scheduling system. The NPC shipped over a million kits to the LCOs.

Administrative Forms and Operational Materials

The Census Bureau printed millions of administrative forms and operational materials for Census 2000. Form quantities were determined by an extensive review of operational workloads, staffing, and administrative requirements. Upon opening, each LCO received an initial supply of administrative materials. Subsequently, preprogrammed resupply deliveries were made to the RCCs and LCOs.²⁴

Disposal of Excess

At the conclusion of Census 2000 field operations, LCOs had large quantities of operational kits and administrative forms that needed to be moved from the leased office space. On average, each LCO shipped approximately 240 boxes containing supplies and other kit materials to the NPC. The NPC sent these supplies to the GSA for resale or disposal, a procedure that was handled as a "business as usual" operation rather than a Census 2000-specific operation.

National Processing Center Support

In preparation for Census 2000, the NPC acquired additional warehouse storage space through a commercial lease. The additional space for decennial operations totaled 396,200 square feet. When added to existing NPC decennial warehouse space, the available storage was 596,200 square feet. The average lease period for warehouse space was 26 months, and the per square foot cost in southern Indiana, NPC's location, was \$3.15.

All incoming materials, forms, envelopes, and supplies to the NPC arrived at the central receiving area. These items were processed and posted to the Oracle Order Entry Inventory, the NPC's inventory management system. The NPC's central shipping office controlled the distribution of materials to the RCCs and LCOs. The NPC shipped more than 60,000 tons of bulk supplies and operational materials between January and May 2000.²⁵

FIELD SAFETY AND SECURITY

The Census Bureau's regional directors had ultimate responsibility for safety and security. As in the 1990 census, the regional director was assisted by the assistant regional census manager, who was operationally responsible for safety and security. Sound procedures outlining the importance of employee personal safety, protection of Title 13 data, and protection of government property played a major role in maintaining a safe and secure environment for office and field

²⁴ For more information on the printing of forms and questionnaires, see Chapter 8, "Addresses and Questionnaire Printing and Mailing."

²⁵ U.S. Census Bureau, Decennial Logistics Staff, Field Division, Census 2000 Decennial Logistics Final Report, May 2001, pp. 8–9.

employees. Managers and supervisors widely publicized the safety program using several media, including U.S. Occupational Safety and Health Administration (OSHA) posters and weekly briefings. They also advised employees to be safety-minded and conscious of their work surroundings at all times.

Census Bureau employees were instructed to report any accident that occurred in connection with their work promptly. Employee reporting instructions and applicable forms were provided in the regional census center (RCC) and local census office (LCO) administrative manuals and employee handbooks. These instructions provided guidance for reporting assaults, threats, personal injuries, personal property claims, third-party claims, and motor vehicle accidents.

Employees were responsible for adhering to safe practices and for promptly reporting accidents and incidents to their supervisors. Employees using their vehicles on official government business were advised to use seat belts and carry adequate liability insurance as well as the necessary amount of insurance for property damage to their own vehicles. Additionally, these employees were required to carry in their cars at all times a supply of Forms SF-91, Motor Vehicle Accident Report, and SF-94, Statement of Witness. Employees were not allowed to carry or have in their vehicles firearms, mace, or other weapons.

Regional Census Centers

Although the assistant regional census manager was responsible for safety and security within the RCC, the administrative area was responsible for the actual day-to-day monitoring, reporting, and follow-up of incidents. Supervisors had the responsibility for the safety education of all employees under their direction and for the reporting of all hazardous conditions found in their units. Office supervisory personnel were responsible for creating a safe environment for all employees by eliminating unsafe conditions and practices. Field supervisors also were responsible for providing guidance to their field staff for claims under the Federal Tort Claims Act.

The administrative supervisor or his or her designee was responsible for inspecting offices, making sure that security signs were in place and visible, the sign-in/sign-out log was maintained, exits monitored, and corrective measures implemented as necessary. Additionally, the administrative supervisor ensured that all safety procedures were followed when swearing in new employees, issuing the appropriate badges, and accounting for badges upon termination of census employment.

Local Census Offices

The LCO manager had primary responsibility for security and safety within the LCO. Any breach of security was reported to the security officer who was designated by the LCO manager. In most offices, the assistant manager for administration was designated as the security officer for all areas, except for the office automation area where the automation technician monitored security.

During Census 2000 operations, the LCOs were visited by observers from Census Bureau headquarters. Whenever possible, visits were scheduled with the field offices in a way that would minimize staff distractions. Only persons wearing proper identification were permitted in the field offices.

Procedures similar to those in the RCCs were followed to ensure that confidential data or census information was protected from unauthorized or inadvertent access. Special sworn status (SSS) individuals were authorized access to Census Bureau work areas containing Title 13 information for official purposes only. Individuals with SSS were paid by a third party and were not considered employees for pay purposes. SSS personnel were appointed and administered the Affidavit of Non-disclosure (using Form BC-1759, Special Sworn Status). The RCC/LCO manuals contained specific procedures for appointing and terminating individuals requiring SSS.

The LCO administrative assistant was responsible for keeping Form D-200, Census Office Employee—Official Credential, in a locked file cabinet or locked desk drawer. This included all D-200 office ID cards issued to observers and visitors, as well as temporary ID cards. The supervisor was responsible for collecting cards from employees at the end of the work assignment and returning them to the administrative assistant.

An employee who reported to work without an ID card was not granted entrance until he or she was identified and signed in. The D-200 form was issued with the current date as the expiration date.

Methods of Security

Security was an ongoing program in the census field offices, with oversight from the headquarters Office of Security. Staff from the Census Bureau's headquarters visited each of the 12 RCCs to provide security awareness training and domestic threat assessments as well as safety and security tips for enumerators. They also conducted a follow-up video conference. Both briefings provided field staff with strategies for addressing a wide variety of security issues. At headquarters, a security duty agent was available 24 hours a day, 7 days a week to provide guidance and direction on security matters.

As a precautionary measure, the Office of Security established a procedure with over 20,000 police departments nationwide to notify RCCs of potential threats to census operations or personnel. Police departments were provided a copy of the Census Bureau's temporary decennial identification badge, the name and telephone number of each regional director, and a U.S. map indicating the location of each RCC.²⁶ Most LCO managers met with the top law enforcement officers in their areas of responsibility and provided facsimiles of Census ID cards and other desired information. The following security measures were taken to provide a safe workplace and protect government and personal property:

Signs. All RCCs and LCOs were given signs²⁷ to be posted in the appropriate places. The signs' directives were to be enforced.

Personal property inspection. The regional directors and assistant regional census managers were authorized to make decisions to inspect personal property should there be any reason to suspect removal of Title 13 data or government property or if there was suspicion of an employee possessing weapons, drugs, or any other prohibited items. A sign was placed at each entrance advising that everyone entering the building (or office) was subject to search.

Government property protection. The Office of Security specified and oversaw the installation and monitoring of intrusion detection systems at the LCOs and RCCs. They also provided guidance and an oversight training video.

The administrative supervisor was responsible for the following:

- Issuing property passes for equipment leaving the premises.
- Preparing a Form CD-50, Personal Property Control, for any equipment going to another office.
- Maintaining an inventory list by serial number of electronic equipment assigned to employees.

Employees were responsible for the following:

- Protecting equipment assigned to them. (Office machines were to be contained in locked storage cabinets or supply rooms when not in use for an extended period of time.)
- Verifying the removal of equipment before a repair person left the office and promptly reporting the loss of any assigned equipment.
- Obtaining advance approval from the regional director for any camera brought into a field office.
- Refraining from personal use of any computer equipment or copying copyright-protected computer software.

²⁶ U.S. Census Bureau, Decennial Payroll/Personnel Staff, "Safety, Accidents, and Injuries: 2000 Decennial Census Branch Report," July 2001.

²⁷ Signs included: "Warning—Government Property," "Visitors Must Register Here," "Restricted Area—Confidential," "Census Operations Area," "Visitors Must Register At Main Entrance," "Restricted Area—Authorized Personnel Only," "Bomb Recognition," "Bomb Checklist," and "Firearms Prohibited."

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- Signing out equipment leaving the premises and obtaining a property pass from the administrative supervisor.

Personal security in the office. To discourage theft, employees were advised to avoid wearing expensive clothes or bringing expensive items into the office, leaving their purses or money in desk drawers when away from work stations, and working after hours in areas that could be unsafe.

Document/software/disk security. Only sworn Census Bureau employees were permitted in areas where address registers and other documents containing confidential information were kept. Disks were stored in locked cabinets.

Security and disposition of confidential material. Information such as applicant, payroll, and address files was stored in a secure location. Disposition of confidential material was in accordance with the RCC administrative manual (D-520, Chapter 20).

AUTOMATION INFRASTRUCTURE

During Census 2000, the Census Bureau made extensive use of computer automation to develop and deploy an advanced telecommunications infrastructure. The automation and telecommunications infrastructure deployed for Census 2000 consisted of several components that can be broadly classified into two categories—data networks and voice and data telecommunications.

The data networks consisted of the Decennial Network Operations Center and local area networks within each local census office (LCO), data capture center (DCC), and regional census center (RCC), as well as the wide area network connections between these components. Using automation software, the data network supported more than 10,000 desktop client systems, over 700 Dell Computer Corporation servers, and 100 servers from Compaq Computer Corporation and Silicon Graphics Incorporated.

Voice and data telecommunications consisted of telephone lines and telephone networks, as well as secure high-speed data lines provided by Government Telecommunications Incorporated and various other contractors and subcontractors. The Census Bureau used a system of frame relay services between LCOs and RCCs to provide both a mechanism for upgrading services and a means for establishing a contingency network if one of the RCCs failed. In addition, a dual system of voice and data lines was established between ROs, RCCs, Accuracy and Coverage Evaluation regional offices (ACEROs), and headquarters, including headquarters buildings in Suitland, MD, and the Bowie Computer Center, to ensure maximum uptime. The use of two separate telephone companies to support data services avoided a single point of failure. The Field Automation Infrastructure Team was responsible for the design, development, and implementation of automation and telecommunications for the RCCs, early local census offices, and LCOs.²⁸

Major Software Systems

Ten major systems were designed to support Census 2000 efforts. Of these, seven were used to support field data collection operations:

- *Geographic Support System (GSS):* This system consisted of the master address file (MAF) and the Topologically Integrated Geographic Encoding and Referencing (TIGER®) database. It provided basic census address lists, maps, and geographic boundary and reference files.
- *Pre-Appointment Management System/Automated Decennial Administrative Management System (PAMS/ADAMS):* This system supported applicant, personnel, and payroll processing.
- *Operations Control System (OCS 2000):* This system controlled and tracked assignments for field office operations.

²⁸ U.S. Census Bureau, Decennial Management Division (DMD), "Census 2000 Field Automation and Telecommunications Infrastructure: Comprehensive Operational Assessment," August 21, 2002, pp. 1–11. The Field Automation Infrastructure Team consisted of members from the Census Bureau's Decennial Systems and Contract Management Office, Decennial Management Division, Field Division, Technologies Management Office, Telecommunications Office, and Financial and Administrative Systems Division.

- *Telephone Questionnaire Assistance/Coverage Edit Follow-Up*: This system handled incoming calls from and outgoing calls to the public and provided for question resolution, data capture, and response to requests for additional forms.
- *Internet Data Collection/Internet Questionnaire Assistance*: This system allowed respondents, on a limited basis, to complete the English-language short form using a special Web site. Internet Questionnaire Assistance allowed Internet users to search for specific or general information on how to complete census questionnaires.
- *Accuracy and Coverage Evaluation (A.C.E.)*: The A.C.E. provided an independent estimate of the number of housing units and persons in order to determine the accuracy of the census count (see Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs”). An independent network system was designed specifically to control and manage A.C.E. field operations.²⁹
- *Management Information System (MIS 2000)*: This system served as the official source of all senior management planning and tracking information, including schedules, performance of divisions and organizations, budget, cost, and progress.

The integration of these systems provided a high degree of automation and organization for the Census 2000 process, while also giving the field offices considerable autonomy in successfully completing their assignments.³⁰

Decennial Field Interface (DFI)

The Decennial Field Interface (DFI) was the framework linking all computer systems used in field data collection and control activities at the LCOs. The DFI consisted of seven key components. In addition to general office support systems (e.g., word processing, spreadsheet, and communications software), Internet and intranet access, and overnight delivery tracking, the DFI provided four applications designed specifically for use in field operations. These consisted of the PAMS/ADAMS, GSS, OCS 2000, and Contact Profile and Usage Management System (CPUMS).³¹

PAMS/ADAMS was the Census 2000 applicant, personnel, and payroll system. It was an automated, enterprise-wide, integrated system that utilized state-of-the-art client server technology to manage widely distributed databases that made information available to RCCs and their associated LCOs. PAMS/ADAMS was composed of administrative management programs that supported applicant tracking and processing, selection records, recruiting reports, personnel and payroll processing, and archiving of historical data.

For 1990 decennial census field operations, the Census Bureau operated separate payroll and personnel systems known respectively as the Decennial Automated Payroll and Personnel System (DAPPS) and the District Office Payroll and Personnel System (DOPPERS). There was also a separate applicant processing and criminal check program called the “Applicant File.” None of these programs was linked to another, and the programs did not share information. Planning for a more integrated system covering payroll and personnel applications, known as the Weekly Regional Automated Personnel and Payroll System (WRAPPS), began in 1992. The purpose of this system was to accommodate an estimated 350,000 temporary census workers to conduct Census 2000 operations. The WRAPPS was intended to be implemented in March 1995 for the test census that year, but did not materialize due to budgetary constraints.

The PAMS/ADAMS project was initiated in 1995 when the Census Bureau’s Administrative Directorate and Field Directorate formed a team of technical and computer system analysts to develop an automated human resources and financial management system for Census 2000 using a commercial off-the-shelf (COTS) software product.³² The system design incorporated the concepts of

²⁹ U.S. Census Bureau, “System Architecture Version 2.0,” 2000, pp. 8-1–8-6.

³⁰ *Ibid.*, pp. 1-1–1-9.

³¹ U.S. Census Bureau, “Local Census Office Manager’s Handbook,” August 16, 1999, p. 4-1.

³² Employees from the Census Bureau’s Decennial Payroll/Personnel Staff and Decennial Administrative Management Systems Staff, along with several outside consultants, composed the PAMS/ADAMS team.

WRAPPS and expanded WRAPPS to include a fully integrated system including applicant, personnel, and payroll functions, as well as a criminal history check. In addition to anticipating a payroll of 350,000 employees at peak, the system needed to support up to 6 million applicants. Senior management determined that time and resource limitations precluded any development effort. In September 1996, the Census Bureau purchased a COTS product—PeopleSoft 5.0—and modified the software to make it compliant with all U.S. Office of Personnel Management rules and regulations.³³

PAMS/ADAMS was initially installed in three regional sites in January 1997 for testing in the Census 2000 Dress Rehearsal. By March 1998, PAMS/ADAMS was completely installed in all regions, and between August and November 1999, it was distributed to all 520 LCOs. Dress rehearsal operations revealed the need for system and program enhancements to prevent duplicate payments and provide a more accurate and reliable method of data entry than the optical character/mark recognition component of the COTS software. Consequently, the Census Bureau abandoned the scanning and OCR/OMR component in favor of an alternative PAMS/ADAMS data entry (PADE) and transfer system. Developed by a team of in-house programmers and contractors, the PADE system provided a user-friendly front-end interface for capturing applicant and payroll information at the LCOs; help and edit features to assist clerks and resolve errors in the keying process; and a file transfer protocol (FTP) component allowing for the transfer of batches from LCOs to RCCs and the update of the RCC database. System enhancements continued throughout the life cycle of PAMS/ADAMS, resulting in a comprehensive automated system that was fully implemented by February 2000 and significantly improved the transfer of payroll and applicant data between LCOs and RCCs.³⁴

PAMS/ADAMS was part of the DFI and interfaced with the Decennial Applicant Name Check, MIS 2000, and OCS 2000. Other systems interfaced with PAMS/ADAMS and relied on it for personnel and payroll information such as cost reporting for the Commerce Administrative Management System, geocoding functions, and data for the Equal Employment Opportunity Office, U.S. Bureau of Labor Statistics, and U.S. Department of Treasury. PAMS/ADAMS contained 3.7 million applications on file, and a maximum of 512,000 individuals were on the weekly payroll during the peak of Census 2000. Overall, the PAMS/ADAMS system managed more than 865,000 employees in the year 2000.³⁵

The GSS component of the DFI consisted of two applications, the Street Name Index and the Personal Computer Map Image Metafile (PCMIM). Drawing on information stored in the MAF and the TIGER® database, these applications provided the RCC and LCO staff with access to necessary geographic functions. The Street Name Index listed the range of street addresses along a street or census block or tract. Using this index, field office staff were able to geocode applicant addresses so that enumerators could be assigned to work in their own neighborhoods. The PCMIM allowed LCO staff to create and produce 11" x 17" maps for field operations, including Assignment Area (AA) maps, block maps, and AA locator maps.³⁶

OCS 2000 was an automated, computer-based system developed to support, manage, and control all field operations for Census 2000. Different field operations occurred at different times prior to and during Census 2000. These operations varied considerably in terms of the nature of the work

³³ The primary organizations developing PAMS/ADAMS were Andersen Consulting (a contractor now known as Accenture); the Field Division (sponsor); and the Financial and Administrative Systems Division (technical lead and programming).

³⁴ U.S. Department of Commerce, Office of Inspector General, Office of Systems Evaluation, "Bureau of the Census: PAMS/ADAMS Should Provide Adequate Support for the Decennial Census, but Software Practices Need Improvement," Final Inspection Report No. OSE-11684, March 2000, pp. 1–16; Titan Systems Corporation, *Census 2000 Evaluation R.2a, Pre-Appointment Management System/Automated Decennial Administrative Management System, System Requirements Study, Final Report*, June 6, 2002, pp. 1–13. In February 2000, PeopleTools 7.0 was released to the RCCs, significantly improving the performance of the PeopleSoft modules. At the same time, the development team released the PAMS/ADAMS data entry (PADE) system with the file transfer protocol (FTP) version.

³⁵ U.S. Census Bureau, Decennial Payroll/Personnel Staff, "2000 Decennial Census Personnel System ADAMS," June 2001, pp. 1–19; U.S. Census Bureau, "Local Census Office Manager's Handbook," August 16, 1999, Chapter 6, D-506.

³⁶ U.S. Census Bureau, "Local Census Office Manager's Handbook" August 16, 1999, Chapter 4.

performed, starting and completion dates, and the number of people involved. OCS 2000 assigned work to all census enumerators, tracked the progress of those assignments, and produced reports on field operations in progress for managers at the RCCs, LCOs, and headquarters. The system printed block and address listings, labels, assignment directories, and management reports. It also tracked and managed shipping documents for materials checked out to DCCs and helped the RCC and LCO staff control and manage OCS 2000-supported operations by generating cost and progress reports.³⁷

CPUMS was a contact database designed to maintain pertinent information about Census Bureau contacts and their services to promote the census. This database was used to track information about organizations that helped promote the census in their areas through a variety of means, including donation of testing and training space, communication with constituents about census jobs and participation in the census, and promotion community-wide through special events. It also provided information lists and reports on various contacts organized by geographic area, program participation, or public commitments.

A.C.E. Automated Data Collection

To complete the A.C.E., laptop computers were used during the Person Interview (PI) and Person Interview Quality Assurance (PIQA) operations to conduct personal visits and telephone interviews with sample households. Laptop computers were also used during other A.C.E. field operations to communicate with field supervisory staff by using a custom mail application and transmitting status reports. Laptop computers for the A.C.E. (LC/A.C.E.) provided an automated interview questionnaire and a case management system to control and manage work assignments. The automation was intended to simplify the interview process to such a degree that minimal training would be sufficient to prepare an inexperienced enumerator to conduct these complex interviews. It was designed to replicate the survey in a manner that minimized the chances for user error to corrupt the dataset. Given the tight schedule of the A.C.E., this automation also proved beneficial by allowing the A.C.E. interview data to be captured more quickly than by using traditional keying techniques.

A.C.E. automation also provided electronic mail services and a means of electronic communication. Interviewers retrieved their assigned cases and questionnaire input files when they connected their laptops via external modem to the A.C.E. telecommunications servers. Completed cases were uploaded to the A.C.E. telecommunications servers at the Bowie Computer Center and at headquarters, where the case files were subject to quality checks. This system was critical for field control and kept field managers apprised of completion status and noninterview rates during production. There were two LC/A.C.E. automated instruments for the computer-assisted personal interview (CAPI), one for PI and another for PIQA. Additionally, each instrument had both an English and Spanish version available to the interviewers.

The Hewlett-Packard Omnibook 900 laptop was selected for the A.C.E. project. A sample size of approximately 300,000 cases was small enough to enable the Census Bureau to contract with a vendor that had been providing laptops since 1996 for other CAPI surveys. The contract was awarded in March 1999. The contract was a small-business set aside and included an option to purchase up to 15,000 laptops. By using a vendor with which the Census Bureau had an established relationship, the agency made a decision on the laptop model in time to write training materials and to test the software on the production laptop. The project plan was jointly developed by the vendor and a Census Bureau team; however, once the contract was in place, another team of Census Bureau personnel assumed control of the integration, production, quality control, and shipping arrangements.

³⁷ U.S. Census Bureau, DMD, David Coon, "Census 2000 Operations Control System 2000 (OCS 2000) Comprehensive Operational Assessment," August 20, 2002, p. 1.

Equipment purchase and integration of laptop kits were accomplished in four waves beginning in April of 1999 and ending in April of 2000. The 9,639 laptop kits required assembly before shipping, which in turn required the contractor to make BIOS³⁸ configuration settings, load the software, and bundle the various accessories (adapters, manuals, batteries, etc.). Although the anticipated laptop production rate was a very demanding 700 machines per week for each wave, the actual rate was 550 units per week during the final and largest integration/production wave. Census Bureau personnel quality-checked a sample of laptop kits each week during the production period prior to the units' shipping to the regional locations.³⁹ The vendor and ACEROs retained a pool of spare laptops and parts to resupply the interviewers when necessary.⁴⁰

Testing and Software Deployment

To ensure consistency in decennial census processes at headquarters and all field offices, the Census Bureau established a test schedule for Census 2000 production systems, including hardware and software. As it did for the 1990 census, the Census Bureau established a "beta site" for hardware and software testing and evaluation. Planning for the beta site began in mid-1996, and modifications were made throughout the process to accommodate changing operational requirements. The beta site was constructed in Federal Office Building 2 at the Suitland Federal Center in 1996. Application software testing began in January 1998 after RCC and LCO servers were installed. This site was configured with hardware and software that replicated the operating environment for census field offices. Its staff consisted of Census Bureau employees and contractors with a wide range of technical skills.

The beta site's primary objective was to assess a system's deployment readiness and to ensure its compatibility with the Census Bureau's networked computing environment. Additional objectives included conducting security testing; monitoring system performance and the configuration of personal computers and servers in field offices; providing assistance in solving technical problems; and releasing and maintaining software for Census 2000 systems.

Evaluation by the beta site typically resulted in a prioritization of software. Normal testing followed the beta site's four-day testing cycle, which included full system testing, regression testing, performance testing, and Year 2000 (Y2K) testing. Special tests such as integration testing, fail/recovery testing, and capacity testing were conducted as needed. There were, however, some situations (e.g., legal- or administrative-ruling compliance or deployment schedule delays) that allowed critical software to bypass beta site testing. Both emergency release and urgent testing requests required special approvals from Census Bureau senior management.⁴¹

Once successfully tested, software was deployed to field offices. The Decennial Systems and Contracts Management Office was responsible for releasing software to the Virtual Memory System (VMS)/NT systems in the National Processing Center, the Unix systems in the RCCs, and the Novell-Novell Directory Services systems in the ACEROs, RCCs, and LCOs.⁴² No changes to the system could be made unless specified by an appropriate Configuration/Change Control Board.⁴³ The beta site was responsible for the configuration management of these systems. During Census 2000 the beta site performed over 1,200 software tests, maintained system configurations for

³⁸ BIOS is an acronym for Basic Input/Output System and is the program that a personal computer's microprocessor uses to get the system started after it is turned on. It also manages data flow between the computer's operating system and attached devices such as the hard disk, monitor, keyboard, mouse, and printer.

³⁹ This slowed down the distribution process but increased quality. The return rate was about 12 units out of 7,000.

⁴⁰ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Laptop Computers for Accuracy and Coverage Evaluation System Requirements Study," Census 2000 Evaluation No. R.2.b., December 9, 2002, pp. 1, 5, 8-9.

⁴¹ U.S. Census Bureau, "Program Master Plan: Census 2000, The Beta Site Testing Facility," February 23, 2000, pp. 3-4, 3-8.

⁴² Virtual Memory System software was written, tested, and maintained at the beta site beginning with the 1990 census.

⁴³ Configuration/Change Control Boards were made up of staff from various areas of a system who decided on the priorities of changes and waivers of changes for particular systems. U.S. Census Bureau, "Program Master Plan: Census 2000, The Beta Site Testing Facility," February 23, 2000, p. 8.

over 8,000 PCs and 570 servers, and effectively utilized a variety of systems management utilities to facilitate configuration management, system monitoring, and Y2K testing activities.⁴⁴

Field Technical Support

In addition to the predeployment software testing and technical support provided by the beta site, Census 2000 field offices relied on internal computer specialists for information technology support and troubleshooting once software was deployed. RCC computer specialists were responsible for all computer and network operations at RCCs. These technicians maintained all hardware and provided technical support for RCC staff. RCC computer specialists also provided first-level troubleshooting and technical support for hardware and operational problems in LCOs.

Automation technicians supervised scanning operations in the LCOs. They also maintained the security of the automation area and its systems. These technicians performed troubleshooting and preventive maintenance for LCO computers and local area networks, and they helped to resolve most technical problems within the LCO.⁴⁵

PERSONNEL

Conducting a modern decennial census requires a considerable mobilization effort as individuals are recruited to fill hundreds of thousands of temporary positions. To conduct Census 2000, the Census Bureau estimated that it would need to consider approximately 3 million applicants in order to fill 865,000 short-term, temporary enumerator positions. Most temporary workers served as enumerators during peak operations in the spring and summer of 2000.⁴⁶

Table 5-1.
Census 2000 Field Jobs

[Includes enumerator and supervisory positions]

Operation	Date	Positions to fill (865,000 temporary jobs)
Service-based enumeration	March 2000	41,000
Update/leave	March 2000	86,000
List/enumerate	March–May 2000	11,000
Group quarters enumeration	April–May 2000	24,000
Nonresponse follow-up	April–July 2000	539,000
Coverage improvement operations	July–August 2000	128,000
Be Counted/QAC programs	March–April 2000	15,000
Undeliverable as addressed distribution	April 2000	14,000
Rural update/enumerate and field follow-up	March–May 2000	6,000

To accomplish its recruiting goals, the Census Bureau hired locally, recruited an ethnically diverse and representative workforce, offered competitive pay rates, and cultivated recruiting partnerships.⁴⁷ Local census offices (LCOs) implemented a strategic recruiting advertising campaign that utilized a variety of media sources to distribute information about the availability of census jobs. Ads were placed in print and electronic media, including the Internet.⁴⁸ The assistant manager for recruiting and the recruiting assistants in the LCOs publicized census jobs among community organizations and key local officials, distributed flyers and brochures, and conducted testing sessions.

⁴⁴ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Operational Requirements Study: The Beta Site Systems Testing and Management Facility," Census 2000 Evaluation No. L.5., January 14, 2003, pp. i–20.

⁴⁵ ACEROs also employed computer specialists to support automation, laptop troubleshooting, and inventory of field laptops. U.S. Census Bureau, "Local Census Office Manager's Handbook," August 16, 1999, pp. 1-4, 1-5, 1-17.

⁴⁶ Although officially hired by one of the 520 LCOs, each enumerator worked from home. As a rule, enumerators worked in the neighborhoods in which they lived. Mark Holdrege, "Recruiting for Census 2000: Overcoming Tremendous Difficulties to Accomplish a Massive Task," paper presented at the Census Advisory Committee of Professional Associations Meeting, October 21–22, 1999, Arlington, VA, p. 2.

⁴⁷ For more information on partnerships, see Chapter 4, "The Partnership and Marketing Program."

⁴⁸ See Chapter 4, "The Partnership and Marketing Program" for a complete description of the Census 2000 marketing campaign.

A combination of federal legislation and administrative decisions allowed people on public assistance, as well as former members of the uniformed services, to work for Census 2000 without losing their federal assistance. Similar provisions were made for federal and military retirees. The Census Bureau also worked with states to ensure that recipients of Temporary Assistance for Needy Families could work for Census 2000 without risk of losing their benefits.

Exemptions

For Census 2000, the federal government instituted four administrative exemptions that waived restrictions on temporary federal work and one exception to the same effect used to attract and maintain qualified candidates for Census 2000 positions. In addition, outside entities granted four public assistance exemptions that allowed for temporary employment without adversely affecting candidates' benefits.⁴⁹ Beginning in late 1996, the Census Bureau's decennial field staff initiated meetings with several agencies to discuss the exemptions that would either make otherwise ineligible candidates eligible for employment or allow them temporary employment without adversely affecting benefits (e.g., retirement annuity reduction or loss of public assistance eligibility).⁵⁰ Exemptions and exceptions to increase the applicant pool for Census 2000 were approved as follows:

- *Waiver of the income offset provision for federal civilian and military annuitants for decennial positions.* Under the provision of the Federal Employees Pay Comparability Act (FEPCA), the U.S. Office of Personnel Management (OPM) delegated the authority to waive the pay/retirement deduction for military and civilian retirees to assist the Census Bureau with meeting the hiring goals for Census 2000. The Census Bureau's regional directors were given authority to grant these exceptions on a case-by-case basis. On October 5, 1999, President Clinton signed the National Defense Authorization Act for Fiscal Year 2000 (Public Law 106-65). Section 651 of this law, which repealed Section 5532 of Title 5, U.S. Code, ended the reduction in retired or retainer pay previously required for members of a uniformed service who were employed in a civilian position with the U.S. government. As a result, prior exceptions and waivers of these reductions approved by the OPM, or by agencies under delegated authority, were no longer needed.
- *Dual federal employment.* Anticipating the staffing challenges posed by Census 2000, the Census Bureau partnered with the OPM to revise federal regulations to allow most federal civilian employees to accept temporary decennial census jobs. This was accomplished by establishing an exception (under provisions of Title 13, U.S. Code, and Title 5, Code of Federal Regulations) to the general prohibition against concurrent employment by two federal agencies. Generally, agencies can determine whether to waive dual employment restrictions; however, both the OPM and the Office of General Counsel interpreted Title 13 as requiring that the U.S. Department of Commerce and Census Bureau first obtain an agency's consent before recruiting its employees. The Census Bureau immediately began a campaign to build support among its fellow agencies for the Dual Employment Initiative. In response to Commerce Secretary Daley's 1998 request, 80 federal agencies signed dual employment concurrence agreements, giving the Census Bureau access to an additional labor force of more than 2.4 million workers.⁵¹

The OPM's final regulations provided an exemption to enable the Census Bureau to hire employees already employed by other government agencies without assuming any cost or responsibility for federal benefits. This exemption applied specifically to appointments with intermittent

⁴⁹ A similar program was instituted for the 1990 census allowing the waiver of restriction on temporary work for federal, military, and postal retirees; people receiving unemployment benefits; families participating in the Aid to Families with Dependent Children Program and Food Stamp Program; American Indians living on reservations receiving general assistance; and people receiving Assisted Housing Program payments. Tammie Nelson, "Census 2000 Hiring Exemptions Program," U.S. Census Bureau, May 2001.

⁵⁰ Agencies involved in these meetings were the U.S. Office of Personnel Management, Department of Housing and Urban Development, Department of Veterans Affairs, Department of Health and Human Services, Social Security Administration, Bureau of Indian Affairs, Department of Agriculture, and Department of Labor.

⁵¹ Federal employees represented a particularly valuable applicant pool because they already possessed pertinent job skills, were generally well-distributed geographically, and were likely to remain with the census through the completion of their work assignments.

work schedules in the regional census centers (RCCs) and LCOs. The exemption did not apply to positions with mixed-tour work schedules in the LCOs (e.g., LCO manager, assistant manager, and administrative assistants) or the RCCs.⁵²

- *Employment of noncitizens.* Consistent with Department of Commerce policy and OPM requirements, when decennial operations began, all applicants were required to be U.S. citizens by birth or naturalization. In rare instances, after all recruiting avenues had been pursued and qualified U.S. citizens were not available, exceptions were considered for temporary employment. On July 14, 1999, the Census Bureau received approval to hire legal resident noncitizens for short-term temporary employment, subject to the restrictions of the annual appropriations act on paying noncitizens.⁵³ All legally eligible applicants were still required to meet Form I-9, Employment Verification, requirements and Selective Service registration requirements.
- *Public assistance exemptions.* Public assistance exemptions were needed to allow recipients to accept temporary employment without adversely affecting their program benefits or benefit eligibility. Exemptions for the following programs were agreed upon:

Public and Indian Housing Program. The U.S. Department of Housing and Urban Development approved an administrative exemption on May 15, 1996, for recipients of low-income housing assistance. This exclusion applied to Census Bureau appointments that did not exceed 180 days.⁵⁴

Temporary Assistance for Needy Families (TANF). At least 25 states made provisions to exclude census income from benefits determinations for program recipients.

Medicaid. The U.S. Health Care Financing Administration and Census Bureau agreed to coauthor a letter to states encouraging them to amend state plans to allow for exemption of census income. Thirty-one states positively amended their plans.

Indian recipients of general assistance. The Census Bureau presented information on Census 2000 at a meeting of tribal TANF directors in Washington, DC, on March 25, 1999. The Census Bureau worked with the U.S. Bureau of Indian Affairs, U.S. Department of Health and Human Services, the Division of Tribal Services, and tribes administering their own TANF programs to exempt census income from general assistance calculations. Twelve tribes agreed to exempt census income from general assistance calculations.

Food Stamp Program. The U.S. Department of Agriculture (USDA) initially stated it could not authorize the waiver due to cost neutrality requirements. On February 18, 2000, the USDA invited states to participate in a demonstration project that allowed them to exempt census income. Forty-four states, the District of Columbia, Guam, and the U.S. Virgin Islands participated.

- *Selective Service.* All male applicants born after December 31, 1959, were required to be registered with the Selective Service system prior to appointment to a federal position. Male applicants between the ages of 18 and 26 were eligible for appointments only after registering with the Selective Service. When an applicant 26 years or older declared that he did not register with the Selective Service, the regional director was delegated authority to adjudicate the case for excepted service positions. This determination was coordinated through the RCC area manager. The regional director had to determine whether the applicant knowingly or willfully failed to

⁵² *Federal Register*, Vol. 63, No. 37, February 25, 1998.

⁵³ According to the Treasury and General Government Appropriations Act (passed by Congress each year to authorize expenditure of appropriated funds), only certain categories of individuals can be compensated for work performed. Individuals who are not citizens or nationals of the United States must fall under one of the following categories to be hired: (1) a person who is eligible for citizenship and has filed a declaration of intention to become a citizen of the United States prior to employment and is residing in the United States; (2) a person who owes allegiance to the United States (i.e., a national but not a citizen of the United States) and who presents a certificate of noncitizen national status issued by the Secretary of State; (3) an alien from Cuba, Poland, South Vietnam, the countries of the former Soviet Union, or the Baltic countries lawfully admitted to the United States for permanent residence; (4) a South Vietnamese, Cambodian, or Laotian refugee paroled in the United States after January 1, 1975; or (5) a national of the People's Republic of China who qualifies for adjustment of status pursuant to the Chinese Student Protection Act of 1992.

⁵⁴ HUD Policy Notice, PIH 2000-1 (HA), May 15, 1996.

register based on the written explanation and documentation he provided. The RCC notified the individual, in writing, of the determination and his right to appeal. A copy of the determination was filed in the individual applicant's folder. All denials were maintained in a separate folder and kept for 2 years from the date of the written determination. Although this was not an "exemption," it was an exception to the rule, granting the Census Bureau flexibility in hiring that it did not have for the 1990 census.⁵⁵

Development of a System of Competitive Pay Rates

One factor that improved the Census Bureau's ability to hire temporary employees for Census 2000 operations was a relatively new policy of paying competitive rates in each LCO area, based on the local average wages. The Census Bureau reviewed average wages for each area and paid its enumerators about 75 percent of the average wage.

Offering competitive pay (see Table 5-2), while common practice in the private sector, was a drastic improvement over previous censuses and proved to be key to Census 2000 recruiting success. In past censuses, an enumerator working in Manhattan or San Francisco received the same pay rate as an enumerator working in a rural area. The Census Bureau recognized that retention of employees would save the time and cost of recruiting and training.⁵⁶ The RCC field operations staff had the flexibility to document and request higher pay rates in an LCO or a county within an LCO if they felt higher pay was necessary.

Table 5-2.
Census 2000 Local Census Office Hourly Pay Rates

Position	Census operations	A.C.E. operations
Field operations supervisor.....	\$12.00–\$19.00	\$12.65–\$19.65
Crew leader.....	\$10.50–\$17.50	\$11.15–\$18.15
Enumerator.....	\$9.00–\$16.00	\$9.65–\$16.65

Source: U.S. Census Bureau, Decennial Management Division, Budget Office.

Selection Process

Applicants were required to take a written exam so that applications for census employment could be ranked. The test consisted of 28 multiple-choice questions designed to assess basic skills and abilities in five areas: reading, mathematics, clerical tasks, evaluation, and organization. Applicants were permitted to take the exam as often as necessary to be considered qualified for a field position. A minimum score of 70 percent was used as the criterion for hiring, but there was no pass/fail score for these applicant screening tests.⁵⁷

Once an applicant achieved a score of 70 or higher, he or she was then subject to a background investigation. The Decennial Automated Name Check (DANC) program was originally designed and implemented for the 1990 decennial census as a way to enhance the screening process of all persons applying for temporary decennial positions. This was the first time that the Census Bureau made an effort to check the background of prospective decennial employees and screen for those who represented an unacceptable risk to the census effort. The name check program has been used continuously since its implementation in 1990. In January 1997, the DANC program was updated for Census 2000 operations. The DANC system retrieved applicant information from the Pre-Appointment Management System (PAMS) database and sent it electronically to the FBI. Information contained in this transmission included the applicant's name, social security number, date of birth, gender, office code, and address. The FBI, in turn, processed this information against its criminal history index and returned results to the DANC system within 2 days. Once processed

⁵⁵ U.S. Census Bureau, "Census 2000 Program Master Plan: Recruitment, Decennial Applicant Name Check (DANC) and Selection," May 8, 2003, pp. 6–8.

⁵⁶ Westat, "Part 1: Census 2000 Staffing Programs, Recruiting Component," Census 2000 Evaluation No. G.1., June 7, 2002, p. 5-1; Darlene L. Monaco, Decennial Management Division, U.S. Census Bureau, "Assessment Report: Census 2000 Nonresponse Followup (NRFU)," Census 2000 Informational Memorandum No. 127, August 5, 2002.

⁵⁷ U.S. Office of Personnel Management, "Census 2000 Hiring Starts in Summer 1998," June 10, 1998.

through the DANC, an applicant was rated “A” (for available) or “UR-R” (for under review-risk), which indicated that the application was to undergo further review to determine if he or she posed a threat to the public’s safety or the agency’s integrity. These ratings were passed back to PAMS. An applicant who received an “A” was eligible for consideration.

After an applicant cleared the DANC, LCO staff began the selection process, evaluating candidates on a number of criteria. The primary selection criterion when hiring enumeration staff was the test score. A score of 70 or more was considered “passing or qualified.” Additional selection criteria included:

- Geographic area of consideration.
- Availability of transportation.
- Number of hours available to work (20 to 40 per week preferred).
- Bilingual proficiency, if this skill was needed.
- Position location.

Applicants who scored highest on the test were selected over other applicants. Eligible applicants received additional points if veterans. This process continued until the number of applicants needed was selected.

For the most part, recruiting efforts for Census 2000 were successful. While there were variations in performance levels across LCOs, by April 2000, 82 percent of LCOs either met or exceeded their recruiting goals. Every LCO had at least three applicants for every enumerator position, and most LCOs had more than eight applicants for each slot. Such high levels of recruiting were strongly associated with competitive pay rates, higher test scores, and lower turnover of LCO management.⁵⁸

Hiring

Once the area manager determined the number of enumerator and crew leader positions to be filled, LCO office staff conducted phone interviews and made job offers to applicants. All applicants who cleared the DANC were listed in the PAMS database according to test score and, if applicable, assigned to one of two priority groups. Priority Group I contained all 10-point compensable disability preferences. Priority Group II contained other 10-point and 5-point veterans at the top of their score group. Clerks then conducted reference checks on field operations supervisor positions and began contacting applicants at the top of the priority lists. Clerks were required to document all attempts to contact an applicant, with a minimum of three attempts before disqualifying an applicant for consideration. All responses from applicants were then entered in PAMS, and for those who accepted job offers, an automated record of training (Form D-275) was entered in PAMS.⁵⁹

TRAINING

Training for Census 2000 field operations varied depending on the position. Most training included 2 to 4 days in the classroom. Enumerators were required to undergo an additional half-day of training in the field. The Census Bureau hired experienced trainers to conduct formal and

⁵⁸ U.S. Census Bureau, “Program Master Plan: Recruitment, Decennial Applicant Name Check (DANC), and Selection,” Informational Memorandum 73, October 5, 2000, pp. 1–12; Westat, “Part 1: Census 2000 Staffing Programs, Recruiting Component,” Census 2000 Evaluation No. G.1., June 7, 2002; Westat, “Part 2: Census 2000 Staffing Programs, Pay Component,” Census 2000 Evaluation No. G.1., pp. i–iv, 64. In its evaluation of Census 2000 recruiting, Westat indicated that the Census Bureau should reassess its reliance on test scores as a predictor of performance given that those with lower test scores tended to be available to work more hours or possessed special language skills.

⁵⁹ U.S. Census Bureau, “Program Master Plan: Recruitment, Decennial Applicant Name Check (DANC), and Selection,” Informational Memorandum 73, October 5, 2000, p. 12.

“Just-in-Time” (JIT) training. The trainers emphasized the importance of cross-training clerks and office management staff. They also stressed the need to maintain continuous communications through daily and weekly staff meetings and between management staff in the field offices and regional census centers (RCCs).⁶⁰

Management Training

RCC managers were required to complete 3 days of classroom training for RCC management overview, as well as any job-specific classroom training, which usually required 1 day per course. Some RCC managers were selected to complete training in crisis communication and media skills (2 to 3 days), and others were required to attend a variety of JIT operational briefings for regional directors, assistant regional census managers, and area managers (1 to 3 days per session).⁶¹

Local census office (LCO) management teams were required to complete a 4-day LCO management overview, as well as relevant job-specific training for LCO managers, assistant managers, and automation supervisors. An additional 1 to 2 days of media skills training and a variety of JIT operational classroom sessions were required of LCO management teams (preclassroom self-study for five sessions and 1 day of classroom time per session).

Administrative Training

The Decennial Payroll/Personnel Staff (DPPS) in the Field Division was tasked with training RCC staff to ensure administrative policies and procedures were understood and implemented and to explain and distribute training materials. Once the RCCs were comfortable with the information, they trained the LCO administrative staff using in-house materials and materials provided by DPPS. Training was delivered in several ways, including conference room presentations provided by DPPS and hands-on learning of personnel and payroll software systems.

DPPS established computer-based training programs (CBT) designed to follow the applicant data entry, selection, training schedule, and hiring process and all aspects of the personnel and payroll database process. In addition to the CBT, LCO administrative staffs used an appointment training module, “Chapter A.” This manual guided the staff through the personnel process of appointment forms, payroll tax forms, and the Oath of Office process.⁶² Administrative clerks learned through on-the-job training, while clerks learned payroll and personnel procedures from the assistant manager for administration and from more experienced clerks.

Field Training

The Census 2000 nonresponse follow-up (NRFU) operation required hiring and training approximately 500,000 people. With less than 20 hours of formal training, these workers were expected to knock on doors to collect census data from about 42 million nonresponding addresses. The Census Bureau’s method of training field staff has remained essentially unchanged over the past few decennial censuses. Instructions were presented to a class of trainees via lecture and discussion and delivered verbatim from a training guide. Practice interviews and role play were interspersed throughout training in order to develop the interviewing skills of trainees.⁶³

The Census 2000 NRFU training program was designed to provide enumerators with 14 hours of classroom training on NRFU duties and responsibilities, 1 half-day of supervised interviewing practice in the field, and 4 hours of on-the-job field training. Although the field work component

⁶⁰ Brad Eaton, Decennial Management Division, U.S. Census Bureau, “Field Office Management and Administration Comprehensive Assessment Report,” August 28, 2002, pp. 1–5.

⁶¹ JIT training was informal training on specific operations, usually the larger and more technical ones. JIT was conducted immediately before an operation began in order to review management procedures related to the operation with staff. U.S. Census Bureau, “Local Census Office Manager’s Handbook,” August 16, 1999, D-506, pp. 10-1, 10-5.

⁶² U.S. Census Bureau, Decennial Payroll/Personnel Staff, “2000 Decennial Administrative Training,” April 2001, pp. i–1.

⁶³ The advantage of verbatim training is a consistent message delivered to hundreds of thousands of employees in a manner that controls cost and timing. The disadvantage is that training is delivered primarily by newly hired employees, not career professionals with years of practical knowledge and field experience. Geraldine Burt and Ruth Mangaroo, Field Division and Foreign Trade Division, “Nonresponse Followup (NRFU) Enumerator Training,” Census 2000 Evaluation No. H.7., March 28, 2003, pp. 1, 27.

was part of the training program, only 67 percent of enumerators surveyed in a postcensus evaluation actually received field training in addition to the classroom component. The majority (approximately 89 percent) of these enumerators indicated they found field training useful, and their performance reflected this. Many crew leaders, however, whose training program did not include a field work component, had little or no practical experience to share with their enumerator trainees. For the most part, however, the NRFU training program proved to be successful. Of those enumerators surveyed, 82 percent felt that they were well-prepared for their first assignments, and 72 percent added that the training program (with or without the field component) provided them with valuable, transferable job skills. A similar training program with these same verbatim requirements was used for all the various field operations.⁶⁴

MAIL CENSUS

The mailout/mailback (MO/MB) method was used to enumerate approximately 254 million people in about 92 million housing units not included in other enumeration operations (update/leave [U/L], update/enumerate, special places, etc., see below). Table 5-3 illustrates the distribution of housing units by type of enumeration area (TEA). MO/MB was conducted in cities, towns, suburban areas, selected rural areas, and small towns in rural areas where mailing addresses consisted mainly of house numbers and street names or other addresses that permitted letter carriers to deliver questionnaires to specific housing units. In essence, MO/MB enumeration required the Census Bureau to develop a master address file (see Chapter 8, “Addresses and Questionnaire Printing and Mailing”) to send questionnaires to all housing units through the mail, and request that someone in each household complete the questionnaire and return it by mail.

Table 5-3.
Distribution of Housing Units by Type of Enumeration Area

Type		Number
1	Mailout/mailback	92,452,739
2	Update/leave	21,334,143
3	List/enumerate	392,369
4	Remote Alaska	27,002
5	Rural update/enumerate (from TEA 2)	886,215
6	Military in update leave area	50,644
7	Urban update/leave	238,253
8	Urban update/enumerate (converted from TEA 1)	70,404
9	Update/leave (converted from TEA 1)	452,872
Total		115,904,641

Source: U.S. Census Bureau, Census 2000, HCEF

Address Listing

The Census Bureau developed a nationwide address list—the master address file (MAF)—that contained the street address (or a comparable location description), the mailing address (if different from the street address), and the census block location of every living quarters in the U.S.

In addition to containing the mailing address (including post office name and ZIP Code) of every occupied or vacant housing unit, the Census 2000 address list included geographic codes that identified the many tabulation areas in which each address was located (e.g., state, county, census tract, and census block). For areas that did not use house number and street name addresses for mail delivery, each Census 2000 address list record also contained additional information and a location description (e.g., “east side of State Highway 12, 4 miles north of intersection with State Highway 122”).

⁶⁴ Ibid., pp. 12, 26–27.

The Census Bureau used these geographic codes and related location information to create enumerator assignment areas, to determine samples for such programs as the Accuracy and Coverage Evaluation, and to help field staff locate every housing unit.⁶⁵

Block Canvassing

In August 1997, the Census Bureau reexamined its program for maintaining the Census 2000 address list in MO/MB areas. Prior to this, the Census Bureau had decided not to canvass all blocks in which city-style addresses were used for mail delivery, as had been done in previous censuses. The agency believed that this operation (known in the 1990 census as “Precanvass”) was not needed in every block for Census 2000 because of the availability of the U.S. Postal Service delivery sequence file (DSF).⁶⁶ However, the Census Bureau’s examination of the results of various census and American Community Survey tests during the 1990s indicated that additional steps were needed to ensure that the Census 2000 address list was complete and up-to-date.

As a result, the Census Bureau reinstated a canvassing operation for all census blocks in MO/MB areas. The canvass commenced during winter of 1998–99 and ended in spring 1999. As part of the canvassing operation, temporary Census Bureau staff visited each census block carrying an extract of the current MAF that included address additions and changes that had been identified by the Local Update of Census Addresses program at that time. Using this list, these staff confirmed the existence of addresses on the list, deleted addresses as nonexistent, or added new addresses.⁶⁷

Multiple Mailing Strategy

Research conducted by the Census Bureau during the 1992 and 1993 census tests demonstrated that using a multiple mailing strategy increased the likelihood of response. For Census 2000 the agency used a strategy that included multiple contacts for MO/MB areas. These contacts included three items. First, a prenotice letter, delivered between March 6 and March 8, 2000, alerted residents in the MO/MB universe that a census questionnaire would soon arrive by mail.⁶⁸ Second was the census questionnaire itself, which was delivered from March 13 to March 15. Third was a postcard that served as a thank-you for respondents who had mailed back their questionnaires or as a reminder to those who had not. These postcards were delivered between March 20 and March 22. This multiple mailing strategy used first-class postage for all 100 million mailing pieces in MO/MB areas for each of the mailings.⁶⁹

Questionnaire Assistance Centers (QACs)

Questionnaire Assistance Centers (QACs) were opened at targeted locations between March 8 and April 14, 2000. The QACs were designed to assist individuals who had questions about completing their census questionnaires, who needed language assistance, who had general questions

⁶⁵ Prepared statement of Kenneth Prewitt, Director, U.S. Census Bureau, before the Subcommittee on the Census, Committee on Government Reform, U.S. House of Representatives, September 29, 1999; U.S. Census Bureau, “Census 2000 Operational Plan,” December 2000, pp. VI-1–VI-8; Frank Vitano, Jim Treat, and Robin Pennington, *Address List Development in Census 2000*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 8 (Washington, DC: U.S. Census Bureau, 2004), pp. 1–4.

⁶⁶ The DSF is a computerized file that contains all delivery point addresses serviced by the USPS, with the exception of general delivery. On the file, each delivery point is a separate record that conforms to all USPS addressing standards. Each record contains the ZIP+4 Code, carrier route code, delivery sequence, delivery type, and seasonal delivery information. Public Law 103-430, the Census Address List Improvement Act of 1994, directed the USPS to provide on a periodic basis a copy of the address information it maintains for mail delivery to the Census Bureau for use in creating and updating the housing unit address list.

⁶⁷ For more information on block canvassing, see Chapter 8, “Addresses and Questionnaire Printing and Mailing.”

⁶⁸ The MO/MB universe consisted primarily of addresses containing street numbers and street names to which the USPS delivered preaddressed census questionnaires.

⁶⁹ Don A. Dillman, “Research and Improve Mail-Back Response Rates for Decennial Census Forms,” paper presented to the Census Advisory Committee of Professional Associations Meeting, April 1993, U.S. Bureau of the Census, Suitland, Maryland; Don A. Dillman, Jon R. Clark, Michael D. Sinclair, “How Prenotice Letters, Stamped Return Envelopes and Reminder Postcards Affect Mailback Response Rates for Census Questionnaires,” paper presented at the U.S. Bureau of the Census Annual Research Conference, March 1993, Arlington, Virginia; Herbert Stackhouse and Sarah Brady, “Census 2000 Mail Response Rates: Final Report,” Census 2000 Evaluation No. A.7.a., January 2003, p. 4.

about the census, or who did not receive a census questionnaire. In total, 23,556 QACs were established in the MO/MB and U/L areas throughout the country.⁷⁰ The QACs resulted in the keying of 559,027 potential census respondents (220,489 utilizing the Be Counted questionnaire).⁷¹

Census Bureau partnership specialists, in consultation with local officials, played an important role in selecting the census tracts where QACs were placed. Once the tracts had been chosen for QACs, partnership specialists contacted local governments and community organizations for space to house the centers. Often, space was provided free of charge by community organizations. Most of the tracts chosen were in areas known to be difficult to enumerate, heavily populated by certain racial and ethnic groups, or in linguistically isolated areas heavily populated by speakers of languages other than English. Publicly accessible locations, such as community centers and social service centers, were set up to house QACs.

Operations staff at the local census offices (LCOs) were responsible for maintaining the QAC sites and for training and scheduling staff to administer the sites. QACs were staffed by paid clerks and volunteers, some of whom had language skills that enabled them to provide expert assistance to potential census respondents experiencing language difficulties.⁷² Paid and unpaid staff provided literacy assistance to respondents. Staff were instructed to complete a Form D-399, Record of Contact, for each potential census respondent who visited the center.⁷³ These forms were transmitted weekly to the LCO, where census staff reviewed them to determine whether the QAC site was receiving the expected amount of traffic or had sufficient staffing and materials. After the QACs closed on April 14, 2000, the Record of Contact forms were sent to the National Processing Center (NPC), where they were keyed for tabulation and data analysis. To indicate their status, questionnaires were assigned codes such as these: questionnaire requires assistance; general problems with the questionnaire; Be Counted language form requested; and language assistance guide used. How respondents learned about the QACs was also indicated.

Although “in-language” questionnaires were not available in the QACs, the following materials, among others, were available:⁷⁴

- *Language assistance guides.* Language assistance guides were user-friendly visual aids that helped census respondents who had language barriers understand and complete the English language short- or long-form questionnaire. Guides were available in 49 different languages⁷⁵ and in large-print English.
- *Language identification flash cards.* These were cards with phrases in each of the available languages. They were used to assist QAC staff in identifying the language spoken by census respondents. A staff member held the card in front of the respondent and moved his or her finger from line to line on the card until the respondent indicated that the clerk was pointing to a line written in a language he or she could understand.
- *Be Counted forms.* Be Counted forms were questionnaires provided to those who had not previously received a questionnaire, who thought that they were not included on a questionnaire, or who were without conventional housing on Census Day. Be Counted forms were available in six languages: English, Spanish, Chinese, Korean, Vietnamese, and Tagalog. Available at QACs, these forms were also distributed at locations throughout the community.

⁷⁰ Questionnaire Assistance Centers were not established in update/enumerate or list/enumerate areas. Enumerators provided assistance to census respondents in those areas.

⁷¹ John Jones and Diane F. Barrett, “Questionnaire Assistance Centers for Census 2000—Final Report,” Census 2000 Evaluation No. H.4., June 25, 2003, pp. ii–iii.

⁷² Volunteers were chosen from local community groups or from organizations entering partnership agreements with the Census Bureau. For more information on partnerships, see Chapter 4, “The Partnership and Marketing Program.”

⁷³ Form D-399, Record of Contact, documented the type and extent of assistance needed.

⁷⁴ “In-language” questionnaires were made available to respondents who spoke a language other than English.

⁷⁵ The available language guides (not available at all QACs) were Albanian, Amharic, Arabic, Armenian, Bengali, Burmese, Cambodian, Chamorro, Chinese, Creole (Haitian), Croatian, Czech, Dari, Dinka, Dutch, Farsi, French, German, Greek, Hebrew, Hindi, Hmong, Hungarian, Ilocano, Italian, Japanese, Korean, Kurdish, Laotian, Polish, Portuguese, Roma, Romanian, Russian, Samoan, Serbian, Slovak, Somali, Spanish, Swahili, Tagalog, Thai, Tibetan, Tigrayan, Tongan, Ukrainian, Urdu, Vietnamese, and Yiddish.

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- *Form D-399, Record of Contact.* These forms were used to document the reason that census respondents visited the QACs. Census respondents who visited or contacted QACs answered the questions on this form. It was administered and completed by QAC staff.

Telephone Questionnaire Assistance (TQA)

The Census Bureau implemented a telephone program to provide the public with assistance in completing census forms. To meet the program requirements, the Census Bureau contracted with Electronic Data Systems (EDS). EDS provided state-of-the-art technology commonly used in customer service environments in the private sector. This included intelligent call routing software and interactive voice response (IVR) technology coupled with a network of commercial call centers functioning as a single virtual call center. The IVR system allowed callers to enter and obtain information through a series of menu options using either the telephone keypad (touch-tone) or, for English-speaking callers, voice response. The intelligent call routing system responded to a request from the AT&T network and routed the calls to an IVR system or, if necessary, to an agent.

The Telephone Questionnaire Assistance (TQA) network was available to the public through language-specific toll-free numbers from March 3 through June 30, 2000. Callers could access the IVR portion of the network 24 hours a day, 7 days a week. TQA agents were available 8 a.m. to 9 p.m. for each of the nation's nine time zones, 7 days a week. TQA services included answering questions about the census and the census questionnaire; providing respondents with a method for requesting a census form or language guide by mail; and providing respondents who met certain criteria an alternative way of responding to the census if they had received a short form.

TQA was delivered in the three phases that corresponded to Census 2000 field activities. Throughout all three phases, callers could use TQA to get basic information or answers to frequently asked questions. During Phase One (March 3 through March 21, 2000) callers were informed that census forms were being delivered to all housing units and that if they did not receive a form by March 22 they should call and request a form. During this phase, replacement forms were mailed only if a census ID was provided.

Phase Two began on March 22 and lasted until April 7. During this period, the recorded greeting gave the Internet address and informed callers that census forms had been delivered, that the information provided must be as of Census Day (April 1), and that if forms were not returned by April 12, an enumerator would visit to collect information. The main menu during this phase allowed callers to request a census form or, for callers with short forms, provided access to agents who could conduct telephone interviews.

Phase Three of TQA lasted from April 8 to June 30. During this period callers were able to retrieve general information, however no forms were mailed. Instead, callers who had not received a form or who had received but not returned short forms were directed to an agent for a short-form interview.⁷⁶

The TQA network consisted of IVR systems and 22 call centers networked together as a virtual call center. Intelligent call routing software routed calls from the AT&T network to the IVR systems, and if necessary, from the IVR to a call center. Intelligent call routing had the capability of identifying and routing a call to an open IVR system. If a caller needed to be transferred to an agent, intelligent call routing could view call activity at the individual agent level and route the call to the most available agent across the network.⁷⁷

The IVR systems provided options in English and Spanish. Ideal for handling routine inquiries, the IVR system often provided users with information, which avoided the need to transfer them to an agent. In the Census 2000 system, a caller was transferred to an operator if the caller gave two invalid responses to a menu, selected a menu option that automatically transferred the caller, or chose to speak with an agent.

⁷⁶ U.S. Census Bureau, "Program Master Plan: Telephone Questionnaire Assistance," July 2001, p. 7.

⁷⁷ Due to unexpectedly high call volumes some undetected intelligent call routing programming problems occurred. In order to overcome the situation and continue taking calls, the prime contractor turned off certain intelligent call routing functions for the dates of March 13 and 14.

To respond to callers' requests, operators used a browser-based desktop tool, called the Operator Support System (OSS). The OSS was written in HTML and Java. Operators at the 22 call centers accessed the OSS through a network to retrieve answers to census-related questions, record mailing address information for census forms or language assistance guides, or conduct short-form interviews if the caller met certain criteria.

Staffing at the call centers was based on projected call volumes that were keyed to the individual day and hour level, with allowances for unexpected spikes. During Census 2000, TQA staffs were able to handle nearly a 25 percent increase in call volume. When call volume far exceeded projections and exhausted agent capacity, a message was sent from the intelligent call routing software to block incoming calls.⁷⁸

Web Site Operations

Census 2000 marked the first time in the history of the decennial census that the Census Bureau provided respondents with the option to submit their census responses via the Internet. As part of a comprehensive plan to simplify public participation and to increase response rates to Census 2000, Census Bureau staff designed a single Web site to serve Internet users. The site contained two major components: Internet Questionnaire Assistance (IQA) and Internet Data Collection (IDC). The intent was to provide respondents with a highly secure Internet filing alternative to the paper-based short-form questionnaire and to assist respondents with completing their census questionnaires.

The IQA consisted of a collection of Web pages that contained all of the materials from the *Census 2000 Questionnaire Reference Book* (QRB). The QRB contained descriptions about using census information and completing each questionnaire item. The IQA site allowed users to search an alphabetic list of topics or select from a list of popular help topics located on a pull-down menu. IQA information was consistent with TQA-provided information, as well as being compatible with the mailout and Internet-based questionnaires used in the IDC.⁷⁹

IQA was online from March 3 to July 7, 2000. Most respondents, however, were not satisfied with IQA. Nearly 62 percent of the respondents indicated that, overall, they were not at all satisfied with the Internet help screens. While nearly 77 percent found it easy or very easy to understand the help screen information, about 58 percent said it was not at all easy to find the help topics for which they were searching. In addition, 65 percent of the respondents stated that the help screen information was not at all helpful. The respondents complained that, while the information on the IQA was easy to understand, it was difficult to locate and generally unhelpful. In short, the IQA did not provide the information that respondents sought.⁸⁰

The IDC effort, on the other hand, received a favorable response from users. Overall, 91 percent of users surveyed were satisfied with the Census 2000 Internet form. IDC questionnaires, however, were completed by less than 1 percent of the total number of census respondents. Out of approximately 117 million households, only 66,556 Internet forms were received, and of these, 65,683 forms were processed by April 18.⁸¹ Short-form recipients were able to respond on the Internet, if they could provide their 22-digit census ID.⁸² Since there was insufficient time to produce a Spanish-language version of the form, Internet responses could be submitted in English only. Though it was met with many challenges, including a low volume of responses, IDC was an

⁷⁸ John Chesnut, Decennial Statistical Studies Division, "Telephone Questionnaire Assistance," Census 2000 Evaluation No. A.1.a., March 20, 2003, pp. v–4.

⁷⁹ U.S. Census Bureau, "Program Master Plan: Internet Questionnaire Assistance Data Collection Operations," undated, p. 3.

⁸⁰ Courtney Stapleton and John Irwin, "Census 2000 Internet Web Site and Questionnaire Customer Support Satisfaction Surveys: Final Report," Census 2000 Evaluation No. A.2.c., April 15, 2002, pp. vi–3.

⁸¹ There is no clear explanation for this discrepancy. Of these, 66,556 submissions were associated with unique MAFIDs. However, some were excluded from Decennial Systems and Contracts Management Office processing due to various submission errors or because they were blank. Erin Whitworth, "Internet Data Collection," Census 2000 Evaluation No. A.2.b., August 14, 2002, pp. 7–8.

⁸² IDC was available only to those who received short-form questionnaires. The system was brought online on March 3 for stateside and Puerto Rico U/L operations. The MO/MB version was not online until March 13. IDC was taken offline on April 18 when the Census Bureau began NRFU operations.

operational success. It proved to be secure, and no hardware or software failures occurred. However, it did not reach its potential. This is probably a result of the Census Bureau's decision not to advertise this response mode. The IDC system was designed and tested to handle tens of millions of forms. Instead, only 63,053 households consisting of 169,257 people were enumerated using just the Internet census form.

Receiving Mail Returns

MO/MB, U/L, and urban update/leave (UU/L) questionnaires were returned by the U.S. Postal Service (USPS) to data capture centers (DCCs) for processing. DCCs checked-in mail returns using laser sorters to read the form bar code through the envelope window. Questionnaire bar codes included a two-digit check digit to ensure that the code was read correctly. The check-in subsystem stored the unique identifier encoded by the bar code in a check-in file. This file was transmitted daily to the Decennial Systems and Contracts Management Office at Census Bureau headquarters to identify the addresses on the decennial master address file (DMAF) that had returned a mail questionnaire. By April 11, 2000, approximately 77.6 million census forms were received and checked into the DCCs in order to produce the nonresponse follow-up (NRFU) universe.⁸³

Many questionnaires, however, were not initially returned to the DCCs. In fact, approximately 9.3 million forms were identified by the USPS as “undeliverable as addressed” for a variety of reasons. These forms were sorted by ZIP Code and retrieved by LCO field staff for redistribution.⁸⁴

Undeliverable as Addressed (UAA)

During the mailout of Census 2000 questionnaires, the USPS designated a questionnaire packet as undeliverable as addressed (UAA) if it could not be delivered successfully to the labeled address. An undelivered packet with the enclosed questionnaire was annotated with a reason for “undeliverability” and sent back to the NPC. Almost half of the undeliverable questionnaires received were stamped or annotated by the USPS with “vacant” as the reason for undeliverability. This was the most common reason questionnaires were not deliverable. Other common reasons for UAA questionnaires included labeled addresses identified by USPS as “no such address” (indicating that the address location did not exist) and labeled addresses identified as not having a mail receptacle.⁸⁵

From March 13 to 18, 2000, UAA questionnaires brought back by letter carriers were gathered by USPS personnel, sorted by ZIP Code, and held in postal trays. On March 18, LCO personnel, from the 317 LCOs in the redistribution operation, retrieved the UAAs. Only questionnaires from pre-selected ZIP Codes were retrieved. These questionnaires were taken to the LCOs for “check-in” as LCO UAA redistribution questionnaires. The remainder of the questionnaires (those not in the pre-selected ZIP Codes) were returned by the USPS directly to the NPC for “NPC only check-in.”

From March 23 to April 7, 2000, LCO enumerators used commercial street maps to attempt delivery. Each UAA questionnaire was placed in a plastic bag and hung on the doorknob of the housing unit to which the questionnaire was addressed. If redistribution was unsuccessful, the UAA packet was returned to the LCO, where it was “checked-out” of the LCO and shipped to the NPC. By redistributing UAA questionnaires in areas where they were clustered, the Census Bureau sought to increase response by getting questionnaires into the hands of potential census respondents early in the mail response period. Another purpose of the redistribution operation was to address geographic clustering of UAA questionnaires.⁸⁶

⁸³ U.S. Census Bureau, “Program Master Plan: Data Capture Systems and Operations,” March 30, 2001, p. 17.

⁸⁴ *Ibid.*, p. 13.

⁸⁵ These may have been cases where the respondents collected mail at post office boxes as opposed to places of residence. The remaining undeliverability categories (duplicate, under construction, demolished, nonresidential, no such apartment, post office box, not deliverable and unable to forward, outside delivery limits, refused, blank/other, and illegible) contributed 6 percent or less each to the universe of undeliverable questionnaires.

⁸⁶ Felipe Kohn, Decennial Statistical Studies Division (DSSD), “The United States Postal Service Undeliverable Rates for Census 2000 Mailout Questionnaires: Final Report,” Census 2000 Evaluation No. A.6.a., April 10, 2003, pp. i–3; John Chesnut, DSSD, “Study of the U.S. Postal Service Reasons for Undeliverability of Census 2000 Mailout Questionnaires: Final Report,” Census 2000 Evaluation A.6.b., September 30, 2003, pp. i–5.

Questionnaires delivered by the USPS or in the census redistribution operation may or may not have been returned by mail. Those not returned by mail were included in NRFU. Any questionnaires that were sent to the NPC designated as final UAA were also included in NRFU. A total of 9.7 million UAA questionnaires were received at the NPC.⁸⁷

Mail Response Rate and Return Rate

The mail response rate refers to the percent of addresses eligible for NRFU that returned questionnaires prior to the designation of the NRFU universe. Response rates are the result of a combination of respondent cooperation level, the housing unit vacancy rate, and the quality of the decennial master address file.⁸⁸

Preliminary analysis indicated that questionnaires mailed back by respondents are more complete and so have lower amounts of imputed information than enumerator returns.⁸⁹ Due to the higher data quality and lower cost associated with self-enumerated responses relative to enumerator-collected responses, the Census Bureau considers a high mail response to the census very important.

The initial mail response rate is defined as the number of mail returns received prior to the cut-off date for determining the NRFU universe, divided by the total number of housing units in mailback areas eligible for NRFU. The final mail response rate is similar but includes all mail returns through the end of the year. Returns included in these response rates are paper questionnaires, responses collected through the TQA and IDC programs, Be Counted forms, and coverage edit follow-up returns.

The mail return rate is different from the mail response rate. The mail return rate is used primarily to determine the level of respondent cooperation, whereas the mail response rate is used to determine the NRFU workload. The mail return rate measures the percentage of occupied housing units that returned questionnaires by April 18, 2000. The denominator of the mail return rate is calculated from the 100 percent Census Edited File with the reinstated housing units. This file includes all occupied housing units in MO/MB areas that were added to the DMAF prior to NRFU and addresses to which questionnaires were delivered by the USPS or during the Census Bureau's UAA redelivery operation. The response rate denominator is greater than the return rate denominator, largely because the response rate denominator includes vacant housing units, UAA addresses, some addresses deleted in U/L and UU/L, and others deleted in either NRFU or coverage improvement follow-up.

Mail response rate. The mail response rate as of April 18, 2000, was 64.3 percent, slightly lower than the 1990 mail response rate of 65.0 percent.⁹⁰ This rate represents 75,608,035 mail returns that were received by April 18, 2000, out of a response rate denominator of 117,661,748 households. Another 3,703,140 questionnaires were returned after April 18, resulting in a final response rate of 67.4 percent, as of December 31, 2000.

⁸⁷ The undeliverable questionnaires that were successfully redistributed by the redistribution operation conducted by selected LCOs are not included in the workload received at the NPC. John Chesnut, DSSD, "Study of the U.S. Postal Service Reasons for Undeliverability of Census 2000 Mailout Questionnaires: Final Report," Census 2000 Evaluation No. A.6.b., September 30, 2003, p. iii.

⁸⁸ Herbert Stackhouse and Sarah Brady, "Census 2000 Mail Response Rates: Final Report," Census 2000 Evaluation No. A.7.a., January 30, 2003, and "Census 2000 Mail Return Rates: Final Report," Census 2000 Evaluation No. A.7.b., January 30, 2003.

⁸⁹ The imputation rate indicated the proportion of people or housing units with missing or inconsistent information for which the Census Bureau used imputation to assign values based on people or housing units with similar attributes. There were two major types of imputation: (1) allocation, in which missing values for individual items are filled in on the basis of information reported on another person or housing unit record and (2) substitution, in which all of the information for a household is duplicated from another household of the same size. "Study Plan for B.1: Evaluation of the Analysis of the Imputation Process for 100 Percent Household Population Items," DSSD Census 2000 Procedures and Operations Memorandum No. Y-1, October 1, 2001.

⁹⁰ U.S. Bureau of the Census, "1990 Census Mailback Questionnaire Check-in Rates, Decennial Planning Division," March 14, 1991; Herbert Stackhouse and Sarah Brady, "Census 2000 Mail Response Rates: Final Report," Census 2000 Evaluation No. A.7.a., January 2003, p. v.

Reflecting the greater effort required of long-form respondents, the short-form mail response rate of 66.4 percent was 12.5 percentage points higher than the long-form mail response rate of 53.9 percent. In 1990, the mail response rates for short forms and long forms were 65.9 percent and 60.6 percent, respectively.⁹¹

Mail return rate. The mail return rate as of April 18, 2000, was 74.1 percent, which was the same as the 1990 mail return rate.⁹² This rate represents 75,163,020 mail returns that were received by April 18, 2000, out of a return rate denominator of 101,398,131 households. Another 4,367,080 questionnaires were returned after April 18, resulting in a final return rate as of December 31, 2000, of 78.4 percent. The final return rate in 1990, which included late mail returns received through the end of the census, was 75.0 percent.

Reflecting the higher response burden of the long-form questionnaire, the short-form mail return rate (as of April 18, 2000) of 76.4 percent was 13.4 percentage points higher than the long-form mail return rate of 63.0 percent. The mail return rates for short forms and long forms in 1990 were 74.9 percent and 70.4 percent, respectively.⁹³

Table 5-4.
Mail Response Rates
[As of cutoff for NRFU]

Description	1970	1980	1990	2000
Total.....	78.3	75.0	65.0	64.3
Short form.....	(NA)	(NA)	65.9	66.4
Long form.....	(NA)	(NA)	60.6	53.9
Difference (S/L).....	(NA)	(NA)	5.3	12.5

Sources: DMAF and DRF-2. Census 2000 Evaluation No. A.7.a., pp. v-2, 10-11; U.S. Census Bureau, *1990 Census of Population and Housing History Part A*, 1990 CPH-R-2A, p. 6-29; GAO, "2000 Census Best Practices and Lessons Learned for a More Cost-Effective Nonresponse Followup," GAO-02-196, p. 12.; U.S. Census Bureau, *1980 Census of Population and Housing History, Part B*, PHC80-R-2B, pp. 5-24-5-25.

Table 5-5.
Mail Return Rates
[As of cutoff for NRFU]

Description	1970	1980	1990	2000
Total.....	87.0	81.3	74.1	74.1
Short form.....	(NA)	81.6	74.9	76.4
Long form.....	(NA)	80.1	70.4	63.0
Difference (S/L).....	(NA)	1.5	4.5	13.4

Sources: HCEF_D', DRF-2, and March 2001 MAF Extract. Census 2000 Evaluation No. A.7.b., pp. vi, 1-2, 12; U.S. Census Bureau, *1990 Census of Population and Housing History Part A*, 1990 CPH-R-2A, p. 6-29; GAO, "2000 Census Best Practices and Lessons Learned for a More Cost-Effective Nonresponse Followup," GAO-02-196, p. 12; U.S. Census Bureau, *1980 Census of Population and Housing History, Part B*, PHC80-R-2B, pp. 5-24-5-25.

Tables 5-4 and 5-5 illustrate the continuing decline in both mail return and mail response rates for the past three censuses. While response and return rates for short forms decreased substantially after 1980, during Census 2000 short-form responses rebounded due in part to the aggressive promotional campaign.⁹⁴ The continued decline in long-form response and return rates, however, suggests that respondents have become much less likely to complete a long-form census questionnaire.⁹⁵ Given this overall decline in public participation, and specifically the continued decline

⁹¹ U.S. Bureau of the Census, "1990 Census Mailback Questionnaire Check-in Rates," Decennial Planning Division, March 14, 1991.

⁹² U.S. Bureau of the Census, "Documentation of the 1990 Census Mail Return Rates," Decennial Statistical Studies Division 1990 REX Memorandum Series #Q13, October 15, 1992.

⁹³ Ibid.

⁹⁴ The final mail response rate increased to 67.4 percent by December 31, 2000. The final response rate for short forms was 69.1 percent and for long forms was 59.4 percent. Census 2000 Evaluation No. A.7.a., pp. v-2, 10-11.

⁹⁵ Eleanor Singer, *Privacy Research in Census 2000*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 1, TR-1 (Washington, DC: U.S. Census Bureau, 2003), pp. 13-14.

in long-form responses, the Census Bureau is likely to encounter greater challenges in encouraging public participation in 2010. Moreover, this continued decline in participation reflects an increasing NRFU workload, and with it, a substantial increase in the cost of completing field enumeration.

ENUMERATION METHODS

Update/Leave (U/L)

For Census 2000 the country was divided into nine types of enumeration areas, determined by address type and enumeration procedure. While the primary method of enumeration was mailout/mailback (MO/MB), the second largest enumeration methodology, based on the quantity of housing units, was update/leave (U/L). U/L was used in areas where mail delivery was predominately to addresses not in house-number, street-name format. Noncity style addresses, such as rural route and box, or post office box, are often not linked to the physical location of the housing unit. Since U.S. Postal Service (USPS) mail delivery was not possible when only a location description was available for a unit, U/L was the methodology used. This methodology required census enumerators to deliver the questionnaire package to the housing units in each U/L area. Areas designated for U/L were primarily rural though not usually located in remote or sparsely populated areas. Designations of U/L were made by block. In Puerto Rico, U/L was the only enumeration methodology used.

During the Census 2000 U/L operation, questionnaires with preprinted address labels were hand-delivered to every housing unit on the U/L address list. Housing units not listed on the address register received hand-addressed questionnaires and their addresses were added to the list. Staff in the field delivering questionnaires also made other updates to the address list and to the maps.

There were 23,525,257 addresses in stateside U/L operations and 1,471,225 in Puerto Rico. This represents the number of addresses that had either a labeled questionnaire that was distributed during U/L or a hand-addressed questionnaire for a unit that was added to the address list during the U/L operation. Questionnaires were distributed to all housing units within U/L areas. Some of the addresses on the U/L address list were deleted as nonexistent or nonresidential. Their labeled questionnaires were not delivered.⁹⁶

Stateside U/L operations added 1,644,174 addresses, and Puerto Rico added an additional 111,787. The number of corrections in stateside areas was 9,045,814 and 751,156 in Puerto Rico. The number of deletes, either as nonexistent or as nonresidential, was 1,228,987 in stateside areas and 122,815 in Puerto Rico. In addition, some units that were deleted in U/L were matched with units added during U/L, using address matching after processing the address file. This resulted in 24,265 moves, all of which were stateside. Units on the address list for U/L that did not receive any of these field actions were verified. There were 11,582,017 of these stateside and 485,467 of these in Puerto Rico.⁹⁷

Urban Update/Leave (UU/L)

The Census Bureau conducted the urban update/leave (UU/L) operation between March 3 and March 31, 2000, with the intent of improving coverage by improving the deliverability of the questionnaires and updating address information and census maps. The UU/L operation targeted urban areas deemed unsuitable for MO/MB. Such areas included multiunit buildings, where the USPS delivered mail to a drop point rather than to individual units, and urban communities, where despite the use of city-style addresses, many residents picked up their mail at post office boxes. The UU/L operation relied on local knowledge to identify areas where the USPS could not adequately deliver the census questionnaires.⁹⁸

⁹⁶ Robin Pennington, "Evaluation of the Update/Leave Operation, Final Report," Census 2000 Evaluation No. F.10. June 6, 2003.

⁹⁷ U.S. Census Bureau, "Census 2000 Operational Plan," DMD/01-1419, December 2000; U.S. Census Bureau, "Program Master Plan for the Census 2000 Update/Leave Operation," December 7, 2000, pp. 1–4.

⁹⁸ Miriam Rosenthal, "Urban Update/Leave," Census 2000 Evaluation No. F.11., October 3, 2002.

In areas designated for UU/L, enumerators delivered census questionnaires and updated their address registers and census maps concurrently. Residents were asked to complete and mail back their census questionnaires. Housing units from which the Census Bureau did not receive a completed questionnaire on or before April 18, 2000, were visited and enumerated during nonresponse follow-up.

Eight regions (Atlanta, Boston, Chicago, Dallas, Denver, Detroit, Philadelphia, and Seattle) chose to participate in the UU/L operation.⁹⁹ Twelve states (California, Colorado, Delaware, Florida, Idaho, Illinois, Louisiana, Michigan, New Jersey, Pennsylvania, Rhode Island, and Washington) and the District of Columbia contained UU/L enumeration areas. Nationwide, 12,843 blocks were covered by UU/L, of which 7,657, or 59.6 percent, contained housing units. The master address file (MAF) included 314,059 residential addresses in UU/L blocks. Removing known duplicates left 310,114 addresses. Of these, 280,086 (90.3 percent) were delivered to the decennial master address file (DMAF). Ultimately, 238,216 addresses were enumerated in the census as either occupied or vacant housing units.

Update/Enumerate (U/E)

The update/enumerate (U/E) method of enumeration targeted communities with special enumeration needs and areas where most housing units may not have had city-style mailing addresses. These included resort areas with high concentrations of seasonally vacant housing units and selected American Indian reservations and colonias—the latter generally were Hispanic-occupied unincorporated communities near the Mexican border. By going directly to the field, the Census Bureau was able to save time and money in areas where it had significant concerns about responsiveness and address integrity.

In U/E areas, enumerators updated address registers and census maps and enumerated housing units at the time of their visits. The Census Bureau conducted the U/E operation from March 13 to June 5, 2000. Every RCC, except Detroit, was responsible for areas enumerated using the U/E methodology. Thirty-five states contained U/E areas.¹⁰⁰ Nationwide, 183,889 blocks were covered by U/E, and 75,827 of these blocks (41.2 percent) contained housing units. The MAF contained 1,191,835 residential addresses in U/E blocks. After removing known duplicates, there were 1,169,090 addresses. Of these, 1,056,317 addresses, (90.4 percent) were delivered to the DMAF. Ultimately, 956,214 U/E addresses were enumerated in the census as either occupied or vacant housing units.¹⁰¹

List/Enumerate (L/E)

List/enumerate (L/E) operations were conducted in remote, sparsely populated areas of the United States, in areas without city-style mail delivery, and in the Island Areas. For Census 2000, approximately 392,000 housing units were enumerated during the L/E operation, compared to 6.5 million in 1990.¹⁰²

In September 1996, the Census Bureau's regional staff identified counties that were the most likely candidates for using the L/E methodology during Census 2000. The main criterion used to prioritize a county was housing unit density. Counties with the lowest housing unit density were

⁹⁹ For Census 2000, regions were given the option to participate in UU/L. Evaluations of this practice recommend that in the future, UU/L participation should be decided by headquarters staff, with information provided by regional staff.

¹⁰⁰ The 35 states were Alabama, Alaska, Arizona, California, Colorado, Connecticut, Florida, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Mexico, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Texas, Utah, Virginia, Washington, Wisconsin, and Wyoming.

¹⁰¹ Miriam Rosenthal, "Update/Enumerate: Final Report," Census 2000 Evaluation No. F.12., December 10, 2002.

¹⁰² In 1990, the USPS delivered Advance Census Reports (ACRs) to all residential addresses in their list/enumerate delivery areas and enumerators collected the questionnaires at the time of enumeration. However, for Census 2000, ACRs were eliminated because L/E areas were delineated at the block level. Carrier routes did not necessarily fall into entire ZIP Codes, so the Census Bureau was not able to tell the USPS where to deliver ACRs. As a result, enumerators enumerated all housing units in their areas using enumerator questionnaires.

assigned the highest priority for enumeration using the L/E method. Once the target counties were identified, additional characteristics—such as weather, limited/seasonal accessibility, long distances between post offices, land uses that precluded or restricted housing units, and percentage of vacant and seasonal housing units—were factored into the effort. The Census Bureau's Geography Division created block files for these counties so that regional staff could identify the blocks being enumerated using the L/E methodology.

Beginning March 13, 2000, enumerators visited housing units in the L/E areas of the country to conduct interviews using enumerator questionnaires. An enumerator canvassed an assigned area on a block-by-block basis, listed addresses, map-spotted living quarters on the census map, and completed a questionnaire (short- or long-form questionnaire) for each housing unit, including vacant housing units.¹⁰³ If the unit was designated on the address register (AR) for a long-form questionnaire (indicated by the letter “L” in Box 11 of the address listing page), the enumerator used this form to complete the interview.

If, on the first visit, an enumerator was unable to contact a household member who was at least 15 years of age, the enumerator recorded the address, or a physical location description, or both in the AR. The enumerator also assigned a map-spot number, map-spotted the housing unit on the block map, and applied ID labels to the questionnaire and the corresponding address line in the AR. He or she also filled out the “record of contact” portion on the front of the questionnaire to indicate the need of a callback and left a Form D-26, Notice of Visit, at the unit before moving to the next address in the assignment area. Included on the Notice of Visit form were the geographic codes for the housing unit and the enumerator's name, telephone number, and best time to be reached. The enumerator left the notice where the housing unit inhabitants were most likely to find it (but not in the mailbox). After the initial visit, the enumerator could conduct a telephone interview when the respondent called or by obtaining the housing unit's telephone number from a local directory or neighbor. Enumerators were expected to make up to three telephone callbacks at different times of the day.

If the enumerator could not contact the respondent and complete a questionnaire after the three callback attempts, the enumerator made two additional personal visits to the housing unit. As a last resort, the enumerator could contact a neighbor or other knowledgeable person to obtain information if contact with a member of the housing unit was not possible.¹⁰⁴

Field Follow-Up

Field follow-up operations were conducted upon completion of L/E. During this phase of the process, enumerators revisited addresses resampled as long forms in the sample tolerance check, housing units identified during the merge operation as missing, and nonseasonal vacant units. Enumerators used enumerator questionnaires to conduct interviews for all three types of follow-up cases. Completed questionnaires were returned to the office, where they were checked in and out of the local census office. After checkout they were shipped (via overnight delivery) to the National Processing Center for data capture.

NONRESPONSE FOLLOW-UP (NRFU)

Nonresponse follow-up (NRFU) was an attempt to obtain completed questionnaires from households in mailback areas that neither responded by mail nor submitted responses via the Internet or Telephone Questionnaire Assistance (TQA) interview. Questionnaires not checked in when the NRFU universe selection process began were identified for NRFU. The NRFU selection process began on April 11, 2000, and continued for just over a week. The Census Bureau updated the decennial master address file (DMAF) before identifying the NRFU universe. The mailback areas

¹⁰³ For living quarters without house-number/street-name addresses, the enumerator had to enter a location description in the address register to help the follow-up operations identify the exact location. The enumerator also updated the census maps.

¹⁰⁴ U.S. Census Bureau, “Census 2000 List/Enumerate Program Master Plan,” February 4, 2000.

comprised 119,090,016 addresses (including Puerto Rico) potentially eligible for follow-up. According to NRFU specifications, the Decennial Systems and Contracts Management Office used the DMAF to identify the initial workload of 44,928,883 addresses, and a file was created for printing the address registers.

The Technologies Management Office released the files of census cases requiring follow-up to the local census offices (LCOs). A review of late mail returns identified 2,555,918 addresses that were checked in between April 11 and April 18, 2000, inclusively. A list of these addresses was sent to the appropriate LCOs for manual removal from the printed address registers. The resulting NRFU workload, which included Puerto Rico, was 42,372,965 addresses.¹⁰⁵

The NRFU operation was scheduled for April 27 through July 7, 2000; however, the actual start and finish dates were April 27 and June 26, with the remaining follow-up cases sent to coverage improvement follow-up (CIFU). The check-in process for NRFU, as reported in the Operations Control System 2000 (OCS 2000), began April 21, the date the first NRFU enumerator questionnaire (EQ) was checked into the OCS 2000, and ended on September 7. Based on OCS 2000 data, the duration of the NRFU operation was approximately 127 days.¹⁰⁶ NRFU exceeded its total planned budget of \$1.1 billion by \$78,946,983 (7.23 percent). An internal assessment attributed this overspending to overstaffing, lower than anticipated production rates, and a redistribution of funds for reinterview operations.¹⁰⁷

Enumeration Procedures

During NRFU, enumerators visited each nonresponding address to determine occupancy status as of Census Day. The Census Day unit status of a housing unit indicated one of three possible conditions: *occupied* by the current household or a different household, *vacant*, or *nonexistent*. Enumerators were instructed to determine the occupancy status of the housing unit, complete the appropriate EQ, and enter an occupancy status code on the address listing page for the unit.

For occupied units, enumerators completed short- or long-form EQs (depending on whether the unit was designated to be in the census long-form sample), collected unreturned mailout questionnaires and Be Counted forms, and conducted necessary interviews to obtain household information.

For housing units that were vacant on Census Day, enumerators determined if a unit was a regular vacant unit, such as a home for sale or rent, or if it was occupied by a household that had a usual home elsewhere. For a unit with regular vacant status, the enumerator completed the appropriate long- or short-form EQ, and for a unit where the whole household had a usual home elsewhere (WHUHE), the enumerator completed the interview summary for the short-form EQ, listing the unit as vacant with population code “00.” For a WHUHE housing unit with a long-form EQ, the enumerator completed both the short-form interview summary and a short-form questionnaire to obtain Census Day information for the household’s usual address.

Addresses classified as nonexistent were those that enumerators determined did not qualify as housing units as of Census Day. An address was classified as nonexistent if it was demolished or burned out, condemned, under construction, or nonresidential. Other nonexistent addresses included those that enumerators were unable to locate and duplicate addresses identified by enumerators in the NRFU address list. Enumerators marked nonexistent addresses for deletion from the address list.¹⁰⁸

¹⁰⁵ Darlene A. Moul, “Nonresponse Followup for Census 2000,” Census 2000 Evaluation No. H.5., July 25, 2002, p. v.

¹⁰⁶ While the OCS 2000 reported check-ins as late as September 7, according to the DMAF, nothing was checked in after August 25, thus there is an unresolved discrepancy between the two data sources.

¹⁰⁷ U.S. Census Bureau, “Assessment Report for Nonresponse Followup, Final,” Census 2000 Informational Memorandum No. 127, August 5, 2002, p. 3.

¹⁰⁸ Although enumerators did not actively look for missing housing units, if an enumerator discovered one, he or she could add the address to the list for enumeration. U.S. Census Bureau, “Program Master Plan, Nonresponse Followup, Revision 1,” December 2000, pp. 10–12.

To obtain information about a household, the enumerator was required to speak with a knowledgeable respondent, age 15 or older.¹⁰⁹ A knowledgeable respondent was generally a member of the household if the unit was occupied, but a neighbor, building superintendent, or other non-household respondent could supply the information if a respondent from the follow-up household was not available. If the household members were on vacation, for example, a knowledgeable nonhousehold respondent could supply sufficient information to complete the questionnaire and exceed the partial interview standards.¹¹⁰

Enumerators were required to make a conscientious effort to obtain completed questionnaires and to keep records of both personal visits and telephone attempts. Enumerators were required to make up to three personal visits and three phone calls for a maximum of six attempts to complete questionnaires for occupied units and units that appeared occupied. If, after the required three personal attempts at varying times, an enumerator was unable to find a household member at home, the enumerator interviewed some other knowledgeable individual to obtain the Census Day status of the address. Such individuals were also known as “proxy” respondents. An enumerator was permitted to interview a proxy respondent on the first visit to a unit that was obviously vacant or should be deleted. Whenever possible, enumerators were encouraged to complete entire interviews although partial interviews were often accepted.¹¹¹

Final Attempt

Once a crew leader’s district reached a 95 percent completion rate, final attempt procedures were implemented. Final attempt procedures were designed to ensure that an enumerator visited, or called by phone if available, each unenumerated unit at least three times during NRFU to obtain a completed interview before a proxy interview or less-than-complete information was obtained. During this operation, an enumerator made one final visit to each address to obtain a complete interview or, at a minimum, the unit status and population count.

Review and Check-In

Enumerators turned in completed questionnaires and pay and work records to their crew leaders daily. Crew leaders reviewed these forms against a checklist of specifications to ensure that they were properly completed, then initialed and dated the certification section of the EQs. Vetted EQs went through assignment control in the LCOs, where assignment control clerks reviewed them to check the completion of such critical items as the:

- Questionnaire label.
- Enumerator’s signature and crew leader’s initials in the certification item.
- Introduction questions (S2–S5).
- Coverage questions (C1 and C2) as appropriate.¹¹²
- Interview summary items (unit status, population count, and if applicable, partial interview, refusal, and closeout).

Questionnaires that failed the review and required resolution were returned to the enumerators through their field operations supervisors. Questionnaires that passed the review were routed to the OCS 2000 for automated check-in. During the check-in operation, the OCS 2000 selected cases for the reinterview program (see below). Questionnaires selected were routed to the reinterview section of the LCOs for data transcription. Upon completion of transcription, the original

¹⁰⁹ “Knowledgeable” meant that a person knew about the household that lived at the address on April 1, 2000, and/or the housing unit as it existed on April 1, 2000.

¹¹⁰ A partial interview was an interview in which the enumerator obtained less than the minimum amount of information required for a complete interview, but obtained at least unit status and population count from the household member or nonhousehold respondent. See U.S. Census Bureau, “Program Master Plan, Nonresponse Followup, Revision 1,” December 2000, p. 14.

¹¹¹ *Ibid.*, p. 9.

¹¹² Coverage question C1 verified that the list of household members on the questionnaire included all the household members who should be counted. Coverage question C2 verified that the household members listed on the questionnaire did not contain anyone who should not be counted.

forms were routed to the OCS 2000 for check-in. Reinterviews were assigned to reinterview clerks for further processing. Reinterviews were conducted using a D-806, Reinterview Questionnaire. All questionnaires were eventually assigned a check-out status and shipped to the appropriate data capture center (DCC).

Special Data Collection Methods for Targeted Areas

The Census Bureau planned to overcome barriers to successful enumeration and improve coverage in Census 2000 by implementing special data collection methods for population groups and geographic areas that historically had a disproportionate share of people missed in previous censuses. Regional census center (RCC) staffs identified such areas by combining their knowledge of local conditions with data drawn from a planning database that correlated various housing, demographic, and socioeconomic variables with nonresponse and undercount rates. Three special enumeration methods were devised for NRFU field operations to improve respondent cooperation and to address concerns about the personal safety of enumerators in these hard-to-enumerate areas. These methods were blitz enumeration, paired enumeration, and the use of local facilitators.

During blitz enumeration, a crew of enumerators conducted enumeration activities in a very compressed time schedule (generally two or three days) under the close supervision of a crew leader, who remained on-site to resolve problems and to assist with respondents who were reluctant to participate in the census. The objective was to create a substantial census presence (particularly in hard-to-enumerate apartment buildings) and complete the large caseload in one massive sweep. Blitz enumeration proved successful in areas with complex households, low levels of cooperation, multiunit buildings, a large number of renters, or low enumerator productivity. While many enumerators who conducted blitz enumeration thought it was beneficial and that it improved overall enumeration in the targeted areas, it resulted in higher rates of refusal, partial interviews, final attempts, and population-unknown cases than both regularly enumerated units and those enumerated using other special methods.

Paired enumeration was used largely to provide support in areas where the safety of enumerators was a concern. One enumerator conducted the actual interview while the other enumerator monitored the surrounding environment and provided support functions as needed. The enumerators would alternate performing interview or support activities at every other household to ensure each retained his or her interviewing skills. Paired enumeration was used also in rural areas containing hard-to-locate housing units. In this situation, one member of the team served as a navigator while the other person drove the car. Paired enumeration not only helped enumerators feel safe in these areas, but also resulted in fewer refusals, partial interviews, and final attempts.

Local facilitators, also known as cultural facilitators, were generally well-known residents, such as community activists, religious leaders, and recognized local figures, who helped facilitate the completion of NRFU. They were sworn in as special sworn status individuals to protect the confidentiality of census information, and they provided assistance such as introducing enumerators to respondents, providing translation services, convincing residents to cooperate, and helping enumerators to find hidden living quarters. They were paid on a contract basis at the rate of an enumerator's hourly pay. This was perhaps the most effective of special enumeration methods. Use of local facilitators resulted in the lowest refusal rates, partial interviews, and population-unknown cases.¹¹³

Approximately 1.7 million (4 percent) of the NRFU cases were enumerated using one of these special methods, and the completeness of the data collected in targeted areas (6.64 percent cases less than complete) was comparable to nontargeted areas (5.93 percent of cases less than complete). Given that targeted areas were expected to provide less complete data, these figures suggest that the use of special methods was effective in increasing both the quantity and the quality of NRFU interviews completed.¹¹⁴

¹¹³ Local facilitator enumeration did have much higher final attempt rates than regular enumeration.

¹¹⁴ Fred R. Borsa and Christine L. Hough, *Data Collection in Census 2000*, Census 2000 Topic Report No. 13, TR-13 (Washington, DC: U.S. Census Bureau, 2004) pp. 24–25.

Supplemental Campaigns

To complete NRFU operations and ensure a census count as complete as possible, the Census Bureau conducted three supplemental campaigns. These included the Be Counted campaign, follow-up for POP 99 housing units, and residual nonresponse follow-up.

“Be Counted” campaign. During the 1970, 1980, and 1990 censuses, the Census Bureau used a post-NRFU campaign called “Were You Counted?” that allowed people who believed they were not counted an opportunity to participate in the census. The Were You Counted campaign resulted in forms being printed in local newspapers and other media. People who believed they were not counted could complete and return a Were You Counted form.¹¹⁵

The Census 2000 Be Counted campaign was similar to the Were You Counted campaign in that it was designed as a special tool. This tool was used to count those who did not receive a census questionnaire, count those who believed they were not included on any other census form, encourage participation of the traditionally undercounted, and provide a means to count those with no usual residence. Although not as widely distributed as the Were You Counted forms, Be Counted forms (BCFs) were available at approximately 85,000 sites and at the Questionnaire Assistance Centers (QACs). They were available in English, Spanish, Chinese, Korean, Tagalog, and Vietnamese. The Census Bureau printed and distributed about 16 million forms in anticipation of receiving 1 million completed forms.

BCFs were placed on March 31 and were removed from the sites on April 17, 2000. These dates coincided with Census Day and the start of NRFU. Respondents were able to call the TQA number and, if they met certain criteria, could provide their short-form data via telephone interview.¹¹⁶ A respondent who did not know his or her census ID could request a form, and one form would be mailed to the respondent’s address. Forms received for people with no usual residence were processed as part of the service-based enumeration (SBE) population.

Addresses provided on the BCFs were matched and geocoded to addresses on the master address file (MAF) to determine whether they should be included in the census. BCF addresses that matched those in the MAF were linked to the IDs on the DMAF with corresponding addresses. BCF addresses that did not match existing MAF records were geocoded. Addresses that matched MAF records that had not been selected for the census were sent to the field for verification, as were the geocoded nonmatches.¹¹⁷ Field verification consisted of an enumerator visiting the address provided on the BCF and determining the status of the address as existing or nonexistent or determining it to be a duplicate of an address already in the DMAF. For verified addresses, information was collected and included in the census. Duplicate and nonexistent addresses were deleted. BCFs added 560,880 people to the census. This, combined with other coverage improvement programs, resulted in improved coverage of groups traditionally undercounted in previous censuses.

POP 99. The POP 99 supplemental operation was the reenumeration of housing units that enumerators identified as occupied during NRFU but did not provide population counts as of Census Day. During this operation, enumerators revisited addresses for which no counts of the population were provided. The workload for POP 99s for Census 2000 was 589,232 housing units.¹¹⁸

Residual nonresponse follow-up (R-NRFU). This supplemental operation was designed to identify and collect information from households for which EQs were lost. In R-NRFU cases, addresses had been checked out as complete by LCOs but did not continue through to data capture at the DCCs. Given that these addresses were not checked in at the DCCs, they were not included in the initial screening for CIFU cases. Since CIFU had developed in a wave format, the Census Bureau developed the R-NRFU operation to account for these lost addresses. R-NRFU identified and successfully reenumerated 121,792 households.

¹¹⁵ The 1980 Were You Counted evaluation estimated that 62,000 forms, covering 140,000 persons, were received. Of these, 71,000 were added to the census after unduplication. In 1990, the Census Bureau received about 352,800 forms, from which about 260,000 persons were added to the census.

¹¹⁶ See above section on Telephone Questionnaire Assistance in this chapter.

¹¹⁷ For information on geocoding, see Chapter 7, “Census Geography and the Geographic Support System.”

¹¹⁸ U.S. Census Bureau, “Program Master Plan, Nonresponse Followup, Revision 1,” December 2000, p. 38.

QUALITY ASSURANCE

Quality assurance programs were developed to ensure the accuracy and quality of the data collected in each of the enumeration operations. These programs consisted of initial and weekly reviews of enumerators' work by crew leaders, as well as office review of address binders, registers, and maps. Crew leaders provided enumerators with immediate feedback following the reviews. Questionnaires, address binders, and address registers were reviewed to verify completeness, and a sample of addresses was revisited to determine how accurately enumerators listed and collected data from the units.¹¹⁹

Crew leaders reviewed enumerators' questionnaires for update/leave (U/L), urban update/leave (UU/L), update/enumerate (U/E), and leave/enumerate (L/E) operations. Completed questionnaires were returned to the appropriate local census office (LCO) on a flow basis, where the assignment control unit reviewed them and forwarded acceptable questionnaires to the check-in area. Questionnaires went through an edit to detect instances of duplication and inconsistency between the interview summary items (unit status, population, and type of vacant) during questionnaire check-in.¹²⁰

LCO assignment control staff attempted to resolve instances of duplicate questionnaires. Office staff also reviewed Form D-929, Merge Error List, to identify cases that were not wanded-in properly. The Operations Control System (OCS 2000) performed an automated merge that flagged IDs wanded-in at only one of the three wanding stages (check-in registers, check-in questionnaires, and check out to data capture center). The merge operation allowed office staff to identify housing units requiring additional fieldwork.

Upon completion of a regional census center's (RCC) L/E workload, RCC staff conducted a sample tolerance check (STC) for the entire LCO. The STC checked to ensure that the proper proportion of the population in each assignment area had been enumerated using the long-form questionnaire. Assignment areas that failed the STC were resampled using STC software. Short-form questionnaire cases that were resampled as long-form questionnaire cases were returned to the field to obtain the necessary long-form data. Long-form questionnaire cases that were resampled as short-form questionnaire cases were not returned to the field. Instead they were resolved through a computerized conversion of long-form questionnaire data to short-form data (also referred to as 100 percent data) known as truncation.¹²¹

The Census Bureau also conducted a quality control program for group quarters (GQ). The GQ Reinterview program targeted large (with a Census Day population of 100 or greater) and small GQs that failed the population estimate check. For each GQ selected, an office clerk contacted the GQ contact person to determine if an enumerator had visited the GQ and if the total number of residents recorded by the enumerator on the Individual Census Report was correct. If the GQ failed reinterview, the clerk flagged the location for rework or reenumeration. The GQ Reinterview

¹¹⁹ For specifications of QA procedures by enumeration method, see Howard Hogan to Brian Monaghan, "Quality Assurance Specifications for Detecting Non-intentional Errors for the Census 2000 List/Enumerate Operation," Decennial Statistical Studies Division (DSSD) Census 2000 Procedures and Operations Memorandum No. II-3, May 20, 1999; Christine Lynch to Brian Monaghan, "Specifications for the Quality Assurance for the Census 2000 Urban Update/Leave Operation," DSSD Census 2000 Procedures and Operations Memorandum No. II-15 (revised), December 13, 1999; Broderick E. Oliver to Rajendra P. Singh, "Profile of the Census 2000 Update/Leave Quality Control Program," DSSD Census 2000 Procedures and Operations Memorandum No. KK-F-03, August 20, 2003; Christine Lynch to Brian Monaghan, "Specifications for the Quality Assurance for the Census 2000 Update/Enumerate Operation," DSSD Census 2000 Procedures and Operations Memorandum No. II-11 (revised), January 31, 2000; Kimberly D. Nether and Broderick E. Oliver to Rajendra P. Singh, "Profile of the Census 2000 Update/Enumerate Quality Control Program," DSSD Census 2000 Procedures and Operations Memorandum No. KK-F-09, March 17, 2004.

¹²⁰ U.S. Census Bureau, "Census 2000 Update/Enumerate PMP," October 26, 2000, p. 3; U.S. Census Bureau, "Census 2000 Urban Update/Leave PMP," December 21, 2000, pp. 4, 9–10; U.S. Census Bureau, "Census 2000 Update/Leave PMP," December 7, 2000, pp. 11–12.

¹²¹ During truncation, the Decennial Systems and Contracts Management Office discarded sample data for housing units that should not have been included in the long-form questionnaire sample.

program identified 145 GQs that had to be reenumerated because of significant differences between the census information obtained by the enumerators and that reported by the GQ contacts during reinterview. As a result of this program, at least 15,430 additional people were added to the GQ count.¹²²

The Census Bureau implemented several quality assurance (QA) measures to determine the effectiveness of nonresponse follow-up (NRFU) operations and evaluate the adequacy of the program design, training materials, and procedures of NRFU. The first addressed concerns over NRFU software, address files, and data collection materials. While not a formal part of the software quality assurance programs, the agency conducted a test of NRFU software before deployment. Despite this testing, some error conditions, while not critical, remained undiscovered until early in NRFU field operations.

Other QA measures focused on LCO operations, including the review of questionnaires and address binders as well as the oversight of OCS 2000 data entry to identify double keying errors. In addition, LCO staffs used OCS 2000 to print labels for the enumerator questionnaires (EQs) indicating the census ID for housing units, and the Decennial Statistical Studies Division designed a QA measure to ensure that these labels/IDs were not only correctly placed on the EQs but that the total number of EQs equaled the number of follow-up addresses for a specified assignment area on the assignment directory listing.

To identify enumerators who produced data errors, the Census Bureau implemented a reinterview program that was conducted concurrently with regular data collection activities. Reinterview cases were identified during EQ check-in. For each selected case, the reinterview section of the LCO prepared a D-806, Reinterview and Reconciliation Questionnaire, and made no more than six attempts to contact the household by telephone. A household that could not be contacted by telephone was assigned to a reinterview enumerator who made no more than three personal visits to complete an interview. The interview consisted of obtaining the Census Day status for the housing unit and, if occupied, the household roster. The information collected by the reinterview enumerator was compared with the original roster information and discrepancies noted. If the discrepancies failed the criteria check, the reinterviewer attempted to determine why the discrepancies existed. Some reasons for discrepancies included misinterpretation of whom to include as a household member, carelessness, and falsification. When all reinterview cases were completed, the office operations supervisor (OOS) recorded the results on a Form D-191, Reinterview Control Record, provided feedback to the enumerator, and took appropriate action. Reinterview questionnaires and control records were then shipped to the National Processing Center for processing.

The three components of the reinterview program were random sample, administrative test, and supplemental reinterview. All enumerators were selected for random sample reinterview. Seven cases were selected for reinterview from each enumerator in order to identify enumerators who falsified data. If the reinterview and reconciliation questionnaires indicated that an enumerator falsified data, the enumerator was removed from the operation and all of his or her prior work was to be redone by another enumerator.

The administrative test compared each enumerator's work characteristics to the work characteristics of the other enumerators within the crew leader district (CLD). An enumerator's performance level was evaluated weekly for each of the following performance indicators on the D-908, Administrative Reinterview Trouble Report: average population per household, vacancy rate, partial interview rate, delete rate, and population-count-of-one rate. This report showed the enumerator's name, average/ratio, and the CLD average/ratio of each work characteristic out of tolerance.¹²³

¹²² For more information on GQ Reinterview, see Broderick Oliver to Rajendra P. Singh, "Profile of the Census 2000 Group Quarters Reinterview Operation," DSSD Census 2000 Procedures and Operations Memorandum No. KK-F-02, December 18, 2002, and Christine Lynch to Brian Monaghan, "Specifications for Group Quarters Reinterview and the Quality Assurance for Census 2000 Group Quarters Enumeration," DSSD Census 2000 Procedures and Operations Memorandum No. II-10, July 12, 1999.

¹²³ Administrative reinterview trouble reports also indicated the date the sample was generated, the CLD code, the field operations supervisor code, the number of short and long forms used in the equation, and the RCC code.

Enumerators whose performance was determined to be out of tolerance, with no apparent justification, were manually flagged for reinterview. Once flagged, the next ten cases for that enumerator were designated for reinterview.

Supplemental reinterview allowed the OOS to spot-check the work of enumerators. At any time, the OOS was able to select additional cases for reinterview by entering the enumerator's name on the Reinterview Selection Record in the OCS 2000. The use of supplemental reinterview granted supervisors greater leeway in their oversight of enumerators' work.¹²⁴

Reenumeration in Hialeah, Florida

During Census 2000, the Census Bureau encountered a challenging situation in Hialeah, FL (LCO 2928), where, despite the establishment of such quality assurance procedures, the LCO manager's failure to implement QA measures properly necessitated the largest census recount in the country. On May 30, 2000, Congresswoman Carrie Meek forwarded to the U.S. Department of Commerce's Office of Inspector General (OIG) an anonymous complaint her office had received from a census employee in the Homestead, FL, LCO. The complaint alleged that Homestead enumerators had been ordered to falsify information they reported on census questionnaires and that the manager of the Hialeah LCO—whose employees were assisting the Homestead LCO with its NRFU workload—had encouraged his employees to do whatever was necessary, including falsifying data on questionnaires, to complete their work quickly. It further alleged that the 209 Hialeah enumerators who had been reassigned to the Homestead office completed questionnaires with “John Doe” and “Jane Doe” and used abbreviated enumeration procedures. The OIG immediately began investigating NRFU procedures, questionnaires completed by Hialeah enumerators, and QA documentation and procedures.

The OIG reviewed Homestead questionnaires completed by Hialeah enumerators and QA documentation at Hialeah and interviewed the Hialeah LCO manager; the area manager; staff at the south Florida offices, including Homestead, Hialeah, and Broward South; regional personnel in Atlanta, GA; and headquarters staff in Suitland, MD. The OIG concluded that QA procedures had not been properly implemented by the Hialeah LCO manager. For over 71,000 questionnaires, Hialeah-trained enumerators began final attempt procedures before the CLD reached its final attempt threshold of a 95 percent completion rate. As the OIG reported its findings and recommendations to the Census Bureau, the agency took a series of actions to ensure the integrity of the data collected from these offices. At Homestead, all questionnaires completed by Hialeah enumerators were set aside and thoroughly reviewed; approximately 1,400 housing units were reenumerated. At Broward South, all 3,200 housing units enumerated by Hialeah enumerators were reenumerated, and at Hialeah, approximately 64,000 units—the entire NRFU workload—were reenumerated.¹²⁵

SPECIALIZED ENUMERATION PROCEDURES

During Census 2000, the Census Bureau implemented a comprehensive set of procedures to enumerate people living in nontraditional housing units. These included people who lived in group quarters, people without housing, people who lived at migrant and seasonal farm worker camps, people living on military installations and ships, and federal employees and their dependents living overseas. Special procedures were also applied to enumerate those who lived in unique areas of the country, such as remote Alaska.

Remote Alaska Enumeration

The concentrated populations and city-style addresses of several Alaskan cities and their suburbs encouraged the Census Bureau to designate them as mailout/mailback (MO/MB) areas. Included in this category were the state's two largest cities—Anchorage and Fairbanks—and smaller cities

¹²⁴ U.S. Census Bureau, “Program Master Plan, Nonresponse Followup, Revision 1,” December 2000, pp. 23–25.

¹²⁵ Darlene A. Moul, “Nonresponse Followup for Census 2000,” Census 2000 Evaluation No. H.5., July 25, 2002, p. 5; U.S. Department of Commerce, Office of Inspector General, Office of Audits, Economics and Statistics Audits Division, *Bureau of the Census: Re-enumeration at Three Local Census Offices in Florida: Hialeah, Broward South, and Homestead*, Final Audit Report No. ESD-13215-0-0001/September 2000.

including Sitka, Haines, and Juneau. Areas not included in the MO/MB enumeration participated in the census through the update/leave (U/L) and list/enumerate (L/E) methods (which were also used in sparsely populated areas of the lower 48 states). The U/L method was used in portions of Bethel, Nome, Valdez, and another 12 cities; L/E was conducted in much of southeast Alaska. The timing of most of these operations was the same as for the other states, although enumeration of remote areas using a modified version of L/E procedures began earlier.

Covering populations ranging from a few people to several hundred, Alaska's remote enumeration was unique. Roads linking the widely scattered communities were rare, so most of these communities were accessible only by small-engine airplane, snowmobile, four-wheel-drive vehicle, dogsled, or some combination thereof.

The timing of the spring thaw (or "breakup" as it is known locally) called for the enumeration of the remote areas to begin in late January to allow for travel during periods when conditions were most favorable. Further, the spring thaw not only made travel more difficult or impossible, it also spurred Alaska Natives to leave home for fishing and hunting expeditions.

Remote area enumeration was coordinated by the Anchorage-based Alaska local census office and its satellite offices in Fairbanks and Juneau. Twelve nonprofit and 12 Alaska Native Regional Corporations comprised geographic entities that conducted business and nonprofit affairs for Alaska Natives. The Census Bureau worked through the corresponding Tribal Government Liaison Program to create a partnership that encouraged participation in the census.

Field staff made advance visits from October through December 1999 to prepare for remote area enumeration. During these visits staff obtained information about the villages from village leaders and created "village profiles" detailing the location of lodging, restaurants, etc. Using standard questionnaires, field staff conducted remote enumeration in three waves beginning January 18, February 22, and March 13, 2000, respectively. Despite collecting the data in January, all census questions were answered in relation to Census Day as in the lower 48 states, that is as of April 1, 2000. Each team leader conducted on-the-job training, supervised enumeration and address listing, and, once the enumeration of a village was complete, met with the village leader or designee to sign a Confidentiality Agreement and review the address listing page. Once the address list validation process was complete, the team leader transmitted the Confidentiality Agreement, along with the address register, to the LCO.¹²⁶

Overseas Counts Program

The Census Bureau worked with federal departments and agencies with overseas employees to obtain counts by home state of U.S. Armed Forces personnel and federal civilian employees stationed overseas and their dependents living with them. These counts were based primarily on the administrative records used by the departments and agencies for payroll and personnel purposes. Included in these counts were members of the U.S. Armed Forces on military vessels assigned to a home port in a foreign country. Active duty personnel temporarily stationed overseas were not included in the overseas counts; they were included with the U.S. resident population. Also excluded from the overseas counts were private U.S. citizens living abroad who were not affiliated with the federal government (either as employees or their dependents) and crews of U.S. merchant ships engaged in foreign transportation.¹²⁷ In Census 2000, "overseas" was defined as anywhere outside the 50 states and the District of Columbia. Thus, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and the Pacific Island Areas were considered to be overseas. The overseas counts were used solely for reapportioning seats in the U.S. House of Representatives. They were not used for redistricting nor included in the counts used for funds allocation.¹²⁸

¹²⁶ U.S. Census Bureau, "Program Master Plan: Census 2000 Remote Alaska Program," Census 2000 Informational Memorandum No. 48, February 28, 2000, pp. 1–5.

¹²⁷ U.S. Census Bureau, "Census 2000 Overseas Enumeration Program Master Plan," undated; U.S. Census Bureau Decennial Management Division, "Overseas Apportionment Counts by U.S. Armed Forces and Civilian Personnel," Census 2000 Informational Memorandum No. 90, January 11, 2001.

¹²⁸ For more information on enumeration in Puerto Rico and the Island Areas, see Chapter 12, "Puerto Rico and the Island Areas."

Congressional Enumeration

Because members of Congress may have multiple residences (generally in a district or home state and also in the Washington, DC, metropolitan area), the Census Bureau implemented special procedures to ensure that all addresses were included in the address files; count members of Congress at their home state addresses; count their family members and unrelated household members at their appropriate residences; ensure that members of Congress and their households were counted only once; and provide members of Congress the opportunity to receive their home state census forms at their Capitol Hill offices. The Census Bureau obtained both the home state and local residence addresses for members of Congress. The Census Bureau created a system whereby specially designated headquarters staff received and reviewed congressional forms and sent them to a data capture center.¹²⁹

Island Areas

The Decennial Management Division (DMD) conducted the island area (IA) Census 2000 in partnership with the government of each IA to ensure that it met the legal requirements set forth in Title 13 of the U.S. Code as well as the specific data needs of the IAs. DMD was responsible for the development of outreach and promotion plans, enumeration procedures, and the data products program. It also supplied forms, questionnaires, materials, and the necessary funds for the IA governments to conduct all data collection activities.

L/E was the basic enumeration strategy employed. As in 1990, all people and housing units were enumerated using a long-form questionnaire. Enumerators visited every housing unit and picked up completed unaddressed questionnaires and Advance Census Reports (ACRs) that had been delivered by the U.S. Postal Service. If an ACR was not completed, an enumerator conducted a personal interview with a household resident to complete it. Enumerators also developed address lists for their assigned areas and map-spotted the locations of living quarters. For special population groups, including those living in group quarters and those with no usual residence, other data collection strategies, such as service-based enumeration and team enumeration, were employed where necessary.¹³⁰

GROUP QUARTERS ENUMERATION

The Census Bureau implemented a comprehensive set of procedures to enumerate people who did not live or stay in traditional housing units in Census 2000. This included people who lived or stayed in group quarters (GQ) (e.g., nursing homes, prisons, group homes, college dormitories, and military quarters and ships), were without conventional housing (e.g., emergency and transitional shelters), or were living in migrant and seasonal farm worker dormitories.

Administrative and geographical entities designated by the Census Bureau as “special places” contained various types of GQs that varied widely from one another. Some had many GQs and large populations, while others contained but a single GQ or very few people; some types of GQs relied heavily on enumeration through administrative data maintained at the GQ, while others more commonly used respondent-filled forms. Additionally, certain types of GQs were more likely to have persons from household questionnaires included in their final tabulations, more likely to have persons counted twice within a GQ, or more likely to have had a greater proportion of persons imputed due to differences in questionnaire counts at different stages of processing.¹³¹ GQ enumeration was conducted by the staff at the local census offices (LCOs). Starting in January 2000, census workers made advance visits to the GQs in their areas to discuss the upcoming enumeration with faculty and staff. These visits promoted participation in the census and identified difficulties that might be encountered during the enumeration.

¹²⁹ U.S. Census Bureau, Decennial Management Division, “Program Master Plan: Census 2000 Congressional Enumeration,” Census 2000 Informational Memorandum No. 138, June 5, 2003, p. 4.

¹³⁰ U.S. Census Bureau, “Program Master Plan: Census 2000 Island Areas,” Census 2000 Informational Memorandum No. 109, March 2001, pp. 28–33. For more information on IA enumeration, see Chapter 12, “Puerto Rico and the Island Areas.”

¹³¹ Kimball Jonas, “Revision 1: Group Quarters Enumeration, Final Report,” Census 2000 Evaluation No. E.5., August 6, 2003, p. v.

From April 1 to May 6, 2000, census workers enumerated people in each GQ by listing all the residents and distributing questionnaire packets. When needed, enumerators provided assistance in completing the questionnaires. Some facilities, such as jails and prisons, were self-enumerated. Some employees in these facilities were awarded special sworn status to ensure confidentiality of data received and to conduct the enumeration following census procedures.

The four main types of GQ questionnaires were the Individual Census Report (ICR), Military Census Report (MCR), Shipboard Census Report (SCR), and Individual Census Questionnaire (ICQ). The ICR was used to enumerate most of the GQ population. The MCR, as the name implies, was used solely to enumerate armed forces personnel. The SCR was used to enumerate both military and civilian shipboard residents. The ICQ was used solely for enumeration of people who had no usual home. ICQs were used at soup kitchens and regularly scheduled mobile food vans.

Special Place Facility Questionnaire Operation

Prior to enumerating, the Census Bureau used a Special Place Facility Questionnaire operation to gather information about both GQs and housing units in each special place. The operation collected and updated existing name and address information for each special place and associated GQ and housing units, identified contact people at each location, determined the type of special place/group quarters, assigned a group quarters type code, determined availability of administrative records, and collected other administrative information. The operation relied upon computer-assisted telephone interviewing (CATI) to collect most of the information, but some was gathered by personal visits using paper Special Place Facility Questionnaires.¹³²

Military/Maritime/Military Vessels Enumeration

In April and May 2000, the Census Bureau enumerated people living on U.S. military installations and maritime vessels during Census 2000. As part of this effort, the Census Bureau worked with the U.S. Department of Defense and the U.S. Coast Guard to identify housing units and other living quarters on the installations and ships assigned to a home port in the United States. Different enumeration methodologies, such as mailing census questionnaires to housing units on installations and enumerating people at their workstations, were used. The Census Bureau also worked with the U.S. Maritime Administration and others to identify maritime vessels in operation at the time of the census and mailed enumeration materials to these vessels for completion.¹³³

As in previous censuses, military bases, as well as both military and civilian ships, were self-enumerated facilities in Census 2000. Enumeration on military bases was supervised by project officers and conducted by unit representatives of each military unit. Project officers and unit representatives were armed forces personnel who, along with clerks who handled the questionnaires on base, were sworn in and trained by census representatives. LCOs hired and trained these Census Bureau representatives. LCO special places operation supervisors (SPOs) coordinated and reviewed their activities. In February 2000, SPOs and census representatives conducted advance visits to subject installations during which they swore in project officers, reviewed enumeration procedures, verified the list and geocodes of GQs, and updated military installation maps.

Census Bureau staff gave MCR and ICR questionnaires and other enumeration materials to project officers who distributed them to unit representatives.¹³⁴ Unit representatives, in turn, distributed the questionnaires to their units, collected the questionnaires and reviewed them for completeness, followed up on missing and incomplete questionnaires, and returned the completed materials to the project officers. After another review by on-base clerks, the project officers returned the questionnaires and other enumeration materials to Census Bureau representatives, who reviewed them and returned them to the LCOs where they were checked-in.

¹³² U.S. Census Bureau, "Program Master Plan: Census 2000 Special Places/Group Quarters Inventory Development," Census 2000 Informational Memorandum No. 113, July 2001.

¹³³ U.S. Census Bureau, "Program Master Plan: Census 2000 Military Installation Enumeration," October 2001; U.S. Census Bureau, "Census 2000 Military/Maritime Vessel Enumeration Overview," Census 2000 Informational Memorandum No. 108, June 21, 2001.

¹³⁴ ICRs were used to enumerate civilians living on military bases.

Enumeration aboard military and civilian ships was coordinated by the National Processing Center (NPC). After receiving a list from the Department of Defense and the U.S. Department of Transportation of military vessels and their assigned home ports, mailing addresses, and estimated personnel, the NPC prepared kits with enumeration materials and manuals, which were mailed to each vessel on January 24, 2000. The commanding officer of each military vessel appointed a project officer to conduct vessel enumeration. The project officer was responsible for receiving census materials, appointing division representatives, and obtaining lists organized by division of personnel assigned to the vessel. On March 31, the project officer distributed personnel lists and enumeration materials to division representatives who distributed MCRs and SCRs in envelopes and Privacy Act notices to personnel in their divisions by April 3.¹³⁵ The sampling procedure used for land-based military applied to shipboard personnel. One in six persons was asked to complete the entire SCR rather than the seven basic questions.

Division representatives gave instructions to complete the SCR or MCR, seal it, and return it to the division representative by April 4. Questionnaires were checked against the personnel list as they were returned to division representatives. Division representatives followed up on nonrespondents, collected remaining questionnaires, and completed SCRs based on administrative records for persons absent from the vessels. After verifying that division representatives had returned their assigned questionnaires and Form D-44 reporting the division enumeration results, the project officer mailed all materials to the NPC by April 10. Any vessels not responding by April 28 were contacted by the Field Division (FLD) and their respective liaison for follow-up.¹³⁶

To enumerate maritime vessels, the Census Bureau first needed to identify and locate such vessels. Beginning on April 27, 1999, letters were dispatched to seven major maritime associations—the U.S. Maritime Administration; the National Oceanic and Atmospheric Administration; the National Marine Fisheries Service; the Alaska Department of Fish and Game, Commercial Fisheries Division; the U.S. Tuna Foundation in San Diego; the Military Sea Lift Command of the Department of the Navy; and the Lake Carriers Association. The letters requested that each association assist the Census Bureau's FLD and NPC in conducting an inventory of maritime vessels by sending the NPC lists of the vessels for which each was responsible.

On April 1, ships' captains distributed SCRs in envelopes and Privacy Act notices to officers, crew members, and passengers who then completed and sealed the SCRs. Each captain collected the questionnaires and completed a Census 2000 Location Report for American Flag Vessels, then returned these forms to the NPC.¹³⁷

Service-Based Enumeration (SBE)

Service-based enumeration (SBE) was designed to enumerate people who did not live in conventional housing and may have been missed in the traditional enumeration of housing units and group quarters. During SBE, the Census Bureau enumerated people at emergency and transitional shelters, targeted nonsheltered outdoor locations, soup kitchens, and regularly scheduled mobile food van stops. Also included in the SBE universe were those who indicated in the address section of Be Counted forms that they had "no address on April 1, 2000." Enumeration of the three major SBE categories was conducted on three separate days at the end of March 2000.

On March 27, people at emergency and transitional shelters were enumerated. A separate ICR was completed for each person. Every sixth person was asked to complete a long-form questionnaire. Each respondent was asked to complete the questionnaire and return it to the enumerator in a sealed envelope.

On March 28, the Census Bureau enumerated people at soup kitchens and mobile food vans that operated on a regular schedule. While conceived as separate operations with distinct training materials, the soup kitchen and regularly scheduled mobile food van enumerations were often

¹³⁵ In January 2000, the U.S. Marine Corps liaison requested that Marine Expeditionary Units aboard Navy vessels be counted with their home bases. As a result, marines aboard Navy vessels were asked to complete MCRs to be mailed separately to the Field Division for processing.

¹³⁶ U.S. Census Bureau, "Census 2000 Military/Maritime Vessel Enumeration Overview," May 24, 2001, pp. 3–9.

¹³⁷ *Ibid.*, pp. 9–12.

conducted by the same enumerators at different times during the day. Enumerators conducted interviews using ICQs at soup kitchens during the meal where the largest number of clients was served. A separate ICQ was used to enumerate each adult and child. Once again, every sixth person was asked to complete a long-form questionnaire. At mobile food vans that operated on a regular schedule, enumerators interviewed each person using separate short-form ICQs.

People at targeted nonsheltered outdoor locations were enumerated on March 29. For this operation, the Census Bureau used partnerships with “gatekeepers” or contacts familiar with the location. These gatekeepers helped identify these locations, and during enumeration, they accompanied the enumerators. In these areas, enumerators were instructed to list each person on a GQ listing sheet, provide the respondent with a Privacy Act notice, and interview each adult and child using the short-form ICR.¹³⁸

The Census Bureau identified 14,817 SBE sites, of which 51 percent were shelters in use during Census 2000. Of the total 283,898 people tabulated in the census at SBE locations, 31,994 people were included in the SBE counts as a result of the Be Counted program. In total, SBE operations added 283,898 people to the Census 2000 tabulations. Of the total, 65 percent were tabulated at shelters, 27 percent were tabulated at soup kitchens and regularly scheduled food vans, and 8 percent were tabulated at targeted nonsheltered outdoor locations.

Because the SBE accounted only for people at these facilities on the day of enumeration, the Census Bureau planned to apply multiplicity estimation to account for people who did not use the facilities on the days of enumeration. Data quality concerns, however, precluded correcting the count of persons actually enumerated using multiplicity estimation.¹³⁹ The multiplicity estimation procedure was based on information provided by those who were counted, that is, the number of times they reported having used the service facilities in the week prior to enumeration.¹⁴⁰ The plan was that an estimate of people not counted on the day of enumeration would be added to the count of people who were counted. Though multiplicity estimates tested well in the 1998 dress rehearsal, the Census Bureau discovered that during Census 2000 a question pertaining to facility usage upon which the multiplicity estimates were based had a low response rate. More troubling, however, was the discovery that respondents, particularly those in shelters, did not provide accurate answers to questions about facility usage. In New York City, for example, city employees collected administrative data in 15 percent of the city’s shelters—the largest shelters in the city—in lieu of collecting data on enumeration day using the proper forms. In this instance, usage questions were not asked for these shelters. Instead, the administrative data were transcribed to shelter forms with the understanding that the usage questions would be left blank. During its review of the data, the Census Bureau discovered that a substantial number of these forms not only contained answers to the usage questions, but that in every instance the response was “1,” which would have resulted in a multiplicity weight of 7. The Census Bureau’s initial response to this apparent response bias was to effectively remove from the multiplicity estimation all those shelters enumerated through administrative records. However, unacceptably high levels of response bias and nonresponse to facility usage questions in SBE enumeration prompted the Census Bureau, out of concerns over the quality of the data collected, to abandon its plans to use multiplicity estimation.¹⁴¹

¹³⁸ A person staying at a shelter was enumerated at the shelter location. A person enumerated at a soup kitchen or mobile food van location was counted at the enumeration location or at a usual address if the respondent provided one. A person at a targeted nonsheltered outdoor location was counted at the enumeration location. Tracey McNally, “Service-Based Enumeration Final Report,” Census 2000 Evaluation No. E.6., November 6, 2002.

¹³⁹ U.S. Census Bureau, “Service-Based Enumeration in Census 2000: Multiplicity Estimation,” Census 2000 Decision Memorandum No. 100, February 22, 2000.

¹⁴⁰ The multiplicity estimate was inversely proportional to the usage question response. Persons responding “1” got an effective weight of 7, while persons responding “7” got an effective weight of 1.

¹⁴¹ U.S. General Accounting Office, *Decennial Census: Methods for Collecting and Reporting Data on the Homeless and Others without Conventional Housing Need Refinement*, GAO-03-227, January 2003; National Research Council, *The 2000 Census: Counting Under Adversity* (Washington, DC: The National Academies Press, 2004), pp. 151–156. For more information on the data products from SBE, see Chapter 9, “Data Products and Dissemination.” Richard A. Griffin, Decennial Statistical Studies Division (DSSD) Census 2000 Procedures and Operations Memorandum No. B-15, February 28, 2001, pp. 1–6.

Transient Night (T-Night) Operation

Census staff conducted a Transient Night (T-Night) operation, designed to enumerate people at locations where residents were highly transient in nature. T-Night enumerators visited and interviewed people occupying campgrounds, commercial/public fairs, carnivals, racetracks, military hotels, marinas, and RV parks between 4 p.m. and 10 p.m. on March 31, 2000.¹⁴² Every person enumerated on T-Night had the opportunity to report a usual residence.

On T-Night, an enumerator visited each assigned T-Night place, met with contact people at the site to explain the purpose of the visit, offered the Privacy Act notice, answered questions, and verified information about the site. The enumerator then completed the appropriate enumerator questionnaire (short or long) for each unit, site, or boat slip in the living quarters at the assigned location.¹⁴³ Other types of special places, such as migrant worker camps, college dormitories, and detention centers, were enumerated on an ongoing basis from April 1 to April 30.

COVERAGE IMPROVEMENT

All censuses before 2000 included a net undercount, and recent censuses have estimated a differential undercount of specific minority populations and other subgroups such as renters, young adult males, and children. The need to improve census coverage to correct, or at least to reduce the undercount, was first identified by George Washington after the first census in 1790. While he complained that the 1790 census count of 3.9 million was too low, it was considered credible enough for apportionment.

Although demographers were aware of the problem, it was not until the 1940s that they began to gain a much clearer understanding of the scope and nature of the census undercount. When demographers compared the 1940 census counts of draft-age men to the Selective Service registration of October 1940, two interesting patterns surfaced. First, the draft registration revealed some 425,000 more men than the census, which yielded an undercount of 2.8 percent for this group. In particular, roughly 229,000 more Black men were recorded in draft registration than in the census, which yielded an undercount of 13.0 percent. Demographers also demonstrated that Black men from urban states registered for the draft in dramatically greater numbers than expected. These findings were confirmed and further refined by later demographic analyses using more modern statistical methodology.

The decennial undercount strongly influenced census design. In an effort to decrease the undercount, the Census Bureau added operations or programs specifically designed to improve coverage. Many of these coverage improvement operations/programs have been characterized by a strategy of inclusion designed to “widen the net” to capture more and more of the undercounted populations. As a result, the total net undercount over the past several censuses has steadily declined, except for the 1990 census, when the net undercount was slightly higher than that of the 1980 census. The relatively high differential undercount of the total Black male population, however, has changed very little during this time period.

In response to the presence of a continued undercount, plans for each successive census employed the strategy of inclusion, although each census used a different combination of coverage improvement operations/programs. Since differential undercount has been even more constant than overall undercount, each census included coverage improvement operations specifically targeting undercounted populations. For example, in the 1990 census, the Census Bureau implemented the parolee/probationer coverage improvement operation to target that hard-to-enumerate population. For Census 2000, the Census Bureau targeted hard-to-enumerate populations using service-based enumeration.¹⁴⁴

¹⁴² In some cases where there were a large number of RVs in an RV park, the enumeration lasted until it was completed and sometimes exceeded the 10 p.m. time limit.

¹⁴³ U.S. Census Bureau, “Census 2000 Operational Plan,” DMD/01-1419, December 2000, p. IX-4.

¹⁴⁴ Service-based enumeration was designed to count people without conventional housing by conducting enumeration at service areas such as shelters, soup kitchens, and the like.

Census 2000 Operations to Reduce Undercount

To minimize the undercount to the extent practicable, many of the operations in Census 2000, including the construction of the address frame, were designed to count the American population with a degree of redundancy built into the enumeration process. Many respondents had an opportunity to answer the census in several different ways. In addition to the basic mailback response option, many respondents also could respond by way of the Internet, telephone, individual enumeration, or completion of Be Counted forms (BCFs) located at private businesses, churches, community organizations, departments of motor vehicles, libraries, post offices, Questionnaire Assistance Centers, and other sites such as schools or municipal buildings. While these operations were designed to reduce overall undercount and improve overall accuracy, the resulting redundancy contributed to counting some respondents more than once. As a result, procedures to unduplicate housing units were also built in where needed, though the unduplication operations were not completely successful. The enumeration process, along with duplication in the housing-unit frame, produced an overall net overcount in Census 2000 of 0.48 percent, with a correlation bias adjustment as measured by the Accuracy and Coverage Evaluation (A.C.E.) Revision II.¹⁴⁵

Enumeration Baseline

The enumeration baseline established during the last four decennial censuses focused on a basic enumeration approach that combined a mailout/mailback methodology with a personal visit to nonrespondents. A paper questionnaire was mailed to a residence, with instructions to complete the form and mail it back to the Census Bureau. In variations of this approach for Census 2000, some questionnaires were delivered to residents by Census Bureau staff, some were left at post offices or other local sites, or some were sent to residents by request; all of these were to be completed and mailed back. Nonresponding households were visited by enumerators who completed the questionnaire for the household or housing unit. The mailback approach was also supplemented by complementary methods such as list/enumerate (L/E) and update/enumerate (U/E), which closely resembled past conventional census methods, and the Internet and telephone response options. After the completion of nonresponse follow-up (NRFU), the Census Bureau identified housing units that it believed should be visited in a number of review, verification, and “clean-up” operations designed to resolve discrepancies in housing-unit status on the questionnaire and improve coverage and the census estimate. This “Quality Counts” campaign was conducted in July and August 2000 and consisted of three coverage improvement/coverage measurement operations: coverage edit follow-up, coverage improvement follow-up, and the A.C.E. These operations included a telephone follow-up program, an enumerator-based follow-up program, and a post-enumeration survey that were added to the basic enumeration approach to ensure the completeness of the data collected for every household.¹⁴⁶

Coverage Edit Follow-Up (CEFU)

A coverage edit follow-up (CEFU) operation was conducted as part of Census 2000. This telephone operation was used to improve data quality and coverage within households in two ways. First, CEFU was used to collect person data for all persons in excess of the six who could be listed on the mailback census forms. Second, it resolved count discrepancies between the respondent-reported household population count and the actual number of data-defined persons recorded on the census form. A person record was determined to have been data defined during previous Census processing based on the number of data items captured for him or her. Prior to collecting person data, telephone enumerators asked a series of probe questions in all CEFU cases. These questions were designed to encourage a respondent to identify persons who should be added to or deleted from the household roster as reported on the respondent’s census mailback form.

¹⁴⁵ For more information on A.C.E., see Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.” The method of demographic analysis, however, produced an overall net undercount of 0.12 percent, substantially lower than the estimated net undercount of 1.65 in 1990. For more information on demographic analysis, see U.S. Census Bureau, Decennial Statistical Studies Division (DSSD) A.C.E. Revision II Memorandum Series #PP-36 “A.C.E. Revision II—Study Plan for Comparison of A.C.E. Revision II Results with Demographic Analysis,” December 31, 2002.

¹⁴⁶ Jon R. Clark and Darlene A. Moul, *Coverage Improvement in Census 2000 Enumeration*, Census 2000 Topic Report No. 10 (Washington, DC: U.S. Census Bureau, 2004), p. 3.

The eligible universe for CEFU consisted of all mail return short and long forms (SFs and LFs) as well as certain BCFs and Internet Data Collection (IDC) responses processed by June 8, 2000. There were versions of these types of Census 2000 forms in several languages, including Spanish, Chinese, Korean, Tagalog, and Vietnamese, as well as the standard English form. The forms in both Spanish and English used in Puerto Rico were also eligible for CEFU. A computer edit of these cases was done to identify households eligible for CEFU.

Enumerator forms used for NRFU, coverage improvement follow-up, and the U/E, L/E, and Remote Alaska operations were not eligible for CEFU because additional follow-up in these cases was not necessary. In those operations, conducted by enumerators through personal visits, information was collected for household members in large households using continuation forms. Also, crew leaders were to have screened enumerator forms for count discrepancies and returned any to the field for rework. Enumerator questionnaires included coverage questions not on the forms eligible for CEFU to help ensure the household rosters were correct.¹⁴⁷

These coverage edits relied on comparisons of respondent-supplied and computer-interpreted data. The Census 2000 coverage edit failures were determined using the respondent-reported household size, the number of data-defined persons on the roster, and the number of names on the continuation roster. There were two types of coverage edit failures: count discrepancy follow-up cases and large household follow-up (LHHFU) cases.

A count discrepancy in which there were more data-defined persons than the reported household size on the form (for SFs, LFs, BCFs, and IDCs) was described as a high data-defined persons (HDDP) count discrepancy. An HDDP count discrepancy would be identified, for example, if the household size was listed as four by the respondent, but six persons were data defined on the form. A count discrepancy in which fewer data-defined persons were identified than were reported on the form was described as a low data-defined persons (LDDP) count discrepancy. An LDDP count discrepancy was identified if, for example, a household size was listed as three by the respondent, but only two persons were data defined on the form.

There were two reasons for edit failures requiring LHHFU. Forms (SF, LF, and IDC) on which the reported household size or the sum of data-defined persons and continuation roster names was greater than six were described as large households. BCFs failed as large household cases if the reported household size or the sum of data-defined persons and continuation roster persons was greater than five. Forms (SF, LF, and IDC) on which exactly six people were listed but the total person count was left blank were identified as possible large households failures.

Conducting CEFU Interviews

Census Bureau staff specified the instrument requirements and selected the cases for CEFU from the universe of eligible cases. The actual follow-up of these cases, however, was contracted to Electronic Data Systems (EDS). EDS assembled the resources to conduct the entire telephone follow-up operation by creating a computer-assisted telephone interview (CATI) instrument; reserving and monitoring the work of multiple call centers; obtaining and training telephone interviewers; and creating and controlling the data-flow infrastructure from receipt of input files to return of the completed cases to the Census Bureau.

The CEFU effort attempted to resolve cases identified for follow-up by telephone. Telephone interviewers, also known as agents, used a browser-based desktop application. The instrument included a series of help sources called the knowledge database. There were no field visits or enumerator follow-ups for CEFU cases that were not resolved over the telephone.

In contrast to the CEFU operation in the 1990 census, the CEFU operation in Census 2000 was precisely scripted. Questions were asked verbatim to ensure consistency from interview to interview, especially since interviewing occurred at 13 different call centers. In addition, telephone interviewers did not have all the information from the complete questionnaires; instead, they had only the relevant data from the questionnaires.

¹⁴⁷ Dave Sheppard, "Coverage Edit Followup: Final Report," Census 2000 Evaluation No. I.1, July 29, 2003.

The interviewing procedure began when the auto dialer system attempted to contact a household in the CEFU universe. If the telephone was not answered, the case was recycled for calls at later dates. If a household was reached, the telephone interviewer determined whether the correct household was reached and, if so, whether an eligible respondent was available to conduct the interview at that time.

According to the Census Bureau's requirements, only a person listed as "person one" or "person two" on the household roster of the mailback form was eligible to respond to the CEFU interview. This was done to increase the likelihood that the respondent would be knowledgeable enough about the household to provide correct responses. If an eligible respondent was available, the interview was conducted. If not, the case was recycled for additional calls at a later date.

The interview began with the telephone interviewer reading the respondent-reported household roster to the eligible respondent. The telephone interviewer then asked nine questions designed to ensure that the household roster was complete and correct. The first five of these questions were based on the Census 2000 residence rules and designed to determine if additional people should be added to the household roster. The last four questions were designed to determine if people already on the household roster should not be listed according to the Census 2000 residence rules.

For each of these nine coverage probe questions, a similar flow of questions was followed. For example, there were questions designed to add people left off the mailback Census 2000 form in error. After being read the household roster, the respondent was asked if a person with particular characteristics (child, roommate, etc.) was living or staying there around the beginning of April and was not included on that roster. If so, that person's name was requested. If a name was offered, the interviewer confirmed with the respondent that this person was living or staying there most of the time as of April 1. This multistage approach allowed the respondent to consider more possible residents while considering the criteria within the follow-up questions.

In addition, the respondent could interrupt the interview at any point to make corrections to the household roster. Telephone interviewers would then take the appropriate action using one of four interrupt options: adding a name to the roster, deleting a name from the roster, indicating that more than one roster name represents one particular household member, and editing the name of a person on the household roster. Upon the completion of this action, the interview was resumed where it left off.

Once all the probe questions were asked and answered, the case was considered count complete, with confidence that the number of persons on the household roster was correct. If information needed to be collected for one or more of the persons on the household roster, it was collected after the nine probe questions were asked. If a person on the roster was confirmed to be a delete or a duplicate, a flag was set and the person record was deleted. Otherwise, the CEFU interview ended.

A contingency, referred to as Phase Two, was implemented between August 1 and August 12, 2000. Phase Two was designed to raise the overall completion rate. It was thought this could be achieved by contacting the noninterviews and by improving the coverage of the non-English speaking population. The requirements for reallocating cases that needed to be retried, ensuring the allocation of remaining cases, and closing out the operation were specified in advance.

Coverage Improvement Follow-Up (CIFU)

The operational plan for Census 2000 coverage improvement follow-up (CIFU) was similar to the 1980 and 1990 plans in that most of the CIFU universe consisted of units classified as either vacant or delete in NRFU that were not also determined in other operations to be ineligible for CIFU. The exceptions included units that were identified as vacant or delete in two prior census operations and units identified as seasonal vacants. The CIFU universe also included addresses that required follow-up but were identified too late to be included in the NRFU. Additional components of the CIFU universe included housing units added from the new construction operation; units added from the update/leave and urban update/leave operations; blank mail returns; lost

mail returns; nonrespondents in Panels 7, 8, and 9 of the response mode and incentive experiment; U.S. Postal Service delivery sequence file (DSF) additions from February 2000 and April 2000; and units added from the Local Update of Census Addresses 1998 and 1999 appeals.

NRFU units from the Hialeah, FL, local census office (LCO) 2928 were also included in the CIFU operation.¹⁴⁸ This LCO did not follow the NRFU final attempt procedures and its corner-cutting led census officials to review information gathered from approximately 71,000 households. In the beginning, the Census Bureau enumerated 20 percent of the city portion of the LCO and sampled the remaining 80 percent. Due to irregularities found in the sample reenumeration, the agency decided to reenumerate the entire LCO. Consequently, an operational plan was developed to combine NRFU and CIFU for this LCO since there was no time in the schedule to conduct separate operations; additional mail-return cuts reduced the NRFU workload by several thousand housing units. Also included in the CIFU workload were a few miscellaneous units that were POP 99s (housing units identified during NRFU as occupied but with no population count identified) or residual NRFU returns.

The CIFU operation was conducted in three separate waves as groups of LCOs completed NRFU. The first wave, which included 342 LCOs, started the CIFU operation on June 26 and finished on July 26, 2000. Wave Two began CIFU on July 10 and finished on August 10. This wave included 175 LCOs. Finally, Wave Three, which included three LCOs (2520, 2525, and 2928), started CIFU on July 30 and finished on August 23.¹⁴⁹

CIFU data collection process. Enumerators visited the CIFU units to determine occupancy status as of Census Day. As with NRFU, Census Day housing-unit status was described as occupied, vacant, or nonexistent. Addresses classified as nonexistent were units enumerators determined did not qualify as housing units as of Census Day and were therefore coded for deletion. Based on status, the enumerators completed the applicable items on the appropriate enumerator questionnaire (EQ). Enumerators initially visited each CIFU address in person; occupied units were allowed up to three personal visits and three phone calls. After the required number of attempts, if an enumerator could not contact a household member at a follow-up address, the enumerator attempted to obtain Census Day status of the unit from a proxy respondent. For units that were obviously vacant or should be deleted, enumerators could interview a proxy respondent on the first visit.

Although the Census Bureau emphasized obtaining complete interviews, partial interviews were accepted in some instances.¹⁵⁰ Completed questionnaires were processed through the assignment control unit in each LCO. Assignment control clerks reviewed the questionnaires to ensure the critical items were completed. Critical items included the questionnaire label; the enumerator's signature and crew leader's initials in the certification item; introduction questions S2–S5, as appropriate; coverage questions C1 and C2, as appropriate; and interview summary items (A) unit status, (B) POP count, and if applicable, (G) partial interview or (H) refusal. Questionnaires failing this review were returned to the enumerators; questionnaires passing this review were routed to the Operations Control System (OCS 2000) for automated check-in. All questionnaires were eventually checked-out using the OCS 2000 and shipped to the appropriate data capture center for data capture.

CIFU quality assurance program. The quality assurance program for CIFU had several objectives. To minimize the number of mislabeled questionnaires, labels were reviewed before being distributed to enumerators. In an effort to ensure that questionnaires were completed correctly, the Census Bureau hired experienced enumerators for CIFU operations, reviewed all questionnaires for completeness, and verified the correct classifications on a sample of housing units. In addition to questionnaire review, specific data items from questionnaires were reviewed in order to minimize the number of data-capture errors on data entered into OCS 2000.

¹⁴⁸ Each LCO was assigned a numeric code to designate its location and track its activities.

¹⁴⁹ Darlene A. Moul, "Coverage Improvement Followup: Final Report," Census 2000 Evaluation No. I.4., May 9, 2003; Darlene A. Moul, "Nonresponse Followup for Census 2000," Census 2000 Evaluation No. H.5., July 25, 2002.

¹⁵⁰ The CIFU Program Master Plan (PMP) defines a partial interview as "an interview in which the enumerator was unable to obtain the minimum amount of information from a household member or a non-household (proxy) respondent but obtained at least Unit Status and Population Count."

Cases eligible for quality assurance dependent review included all the CIFU universe components, except the vacant and deleted housing units identified in NRFU, which were identified by an asterisk on the questionnaire label and address listing pages. As each questionnaire was submitted by an enumerator, the crew leader examined the census ID on the questionnaire. If an asterisk followed the ID number, the housing unit was eligible for the dependent review. If the housing unit was occupied, no additional action was necessary in this phase. If the housing unit was coded as vacant or delete, it was revisited by the crew leader and a decision regarding the correctness of the original classification of the housing unit was noted. When a new questionnaire was used for a vacant or delete case, it was coded as a “replacement” in Item H of the interview summary section of the EQ.

CIFU operations covered 3.9 million vacant units and 2.6 million delete units. Approximately 21.9 percent of the vacant units were converted to occupied and 24.6 percent of the deletes were converted to occupied, resulting in a net gain of approximately 3.1 million people. In addition, more than 88 percent of the lost mail returns and 81.2 percent of the blank mail returns yielded valid housing units. Like NRFU, CIFU succeeded in enumerating a higher percentage of the groups that were typically undercounted (e.g. males, young people, Hispanics, Blacks, and other races). At a cost (stateside) of \$202.4 million, CIFU resulted in substantial improvements in coverage.¹⁵¹

ACCURACY AND COVERAGE EVALUATION (A.C.E.)

The Accuracy and Coverage Evaluation (A.C.E.) was an independent post-enumeration survey designed to measure coverage error. An initial A.C.E. sample of block clusters was drawn, and housing units within the sampled block clusters were listed. This universe was reduced through subsampling operations, and the residents of remaining housing units were interviewed during the A.C.E. person interview.

The A.C.E. was designed to use dual system estimation to measure coverage error. This estimation method assumes two independent lists of the population—one drawn from the original census enumerations, and the other that consists of people represented by the sample selected frame for the A.C.E. survey. For the 2000 A.C.E., the Census Bureau selected a stratified random sample of blocks designed to be representative of racial and ethnic composition, tenure (owner or renter), and other variables. The final sample consisted of approximately 11,800 block clusters with approximately 314,000 housing units. It was designed to provide sufficient precision to estimate the true population for groupings of the population known as post-strata. Each person belonged to one and only one poststratum. Post-strata were constructed with the goal of grouping individuals who had similar probabilities of having been included in the initial census. Census 2000 post-stratification variables included race, ethnicity, age, sex, tenure, mail return rate, and metropolitan status/census enumeration method. The Census Bureau estimated overcounts and undercounts for each poststratum by comparing the estimated true population based on the dual system estimate for each poststratum to the number of individuals counted in the initial census enumeration for each poststratum.

Ensuring that the A.C.E. and the initial census were operationally independent was essential to the proper conduct of the A.C.E. Independence required that the probability of a particular household or person being included in the A.C.E. was not affected by the initial census operations and that the probability of people being included in the initial census was not affected by A.C.E. operations.

The A.C.E. independent interview was conducted by separately trained field staff using computer-assisted personal interview (CAPI) technology. Some interviews were done in an early telephone phase, and others were done later by personal visit. CAPI refers to a method of data collection

¹⁵¹ For more information on QA specifications for CIFU, see Howard Hogan to Brian Monaghan, “Quality Assurance Specifications for the Census 2000 Coverage Improvement Followup Operation,” DSSD Census 2000 Procedures and Operations Memoranda No. II-14 Revision #2, June 7, 2000; Kimberly Nether to Rajendra P. Singh, “Profile of the Census 2000 Coverage Improvement Followup Quality Control Program,” DSSD Census 2000 Procedures and Operations Memoranda No. KK-F-04, September 17, 2003; Howard Hogan to Michael Longini, “Quality Assurance Requirements for the Census 2000 Coverage Improvement Followup Quality Assurance Operation,” DSSD Census 2000 Procedures and Operations Memoranda No. II-16 (revised), June 7, 2000.

that used a laptop computer. The questions to be asked were displayed on the screen and responses were entered directly into the computer. Whenever possible, a telephone interview using CAPI was attempted for households for which the census questionnaire had been completed and a telephone number had been obtained. This interview was conducted concurrently with the initial census follow-up of nonrespondent households (NRFU). Door-to-door interviewing with CAPI did not begin until the initial census NRFU was nearly completed in a given block cluster. An A.C.E. enumerator attempted to secure an in-person interview with a household member; the enumerator would interview a knowledgeable proxy respondent only if a household respondent was not available.¹⁵²

The A.C.E. was a continuation of the Census Bureau's efforts—begun following the 1950 census—to conduct a formal study of coverage of the population. The stated intent of the effort was to improve census designs and to measure and perhaps correct the resulting undercount. For Census 2000, the A.C.E. was designed to serve two purposes. The A.C.E. sought to measure and assess coverage of the population, both total and in various subdivisions such as race, ethnicity, sex, geographical areas, and socioeconomic groupings, as well as to acquire data that could serve as the basis for correcting census counts. Although early planning of the A.C.E. considered using dual system estimation to produce a “one number census,” the 1999 Supreme Court ruling on the use of sampling for congressional apportionment necessitated that the survey be redesigned to focus on nonapportionment uses.¹⁵³

CLOSEOUT

During Census 2000 the Census Bureau leased and operated 520 local census offices (LCOs) to conduct the data collection operations in the field. By October 13, 2000, field operations were concluding and LCOs were closing as field verification was completed. Closeout of these offices was a coordinated effort across the 12 regional census centers (RCCs), the Puerto Rico Area Office, headquarters, and the General Services Administration regional offices.

LCOs were closed in groupings called waves. The first wave closed on August 31, and the last wave closed October 26, 2000 (see Table 5-6). The closeout process began 45 days before each anticipated lease termination date. Every 15 days, beginning in mid-July and running through mid-September, the Census Bureau selected the next group of LCOs to be closed. Accuracy and Coverage Evaluation regional offices were not part of this phase of closeout; they were closed in the spring of 2001.¹⁵⁴

¹⁵² Kenneth Prewitt, “Accuracy and Coverage Evaluation: Statement on the Feasibility of Using Statistical Methods to Improve the Accuracy of Census 2000,” U.S. Census Bureau, June 2000.

¹⁵³ U.S. Census Bureau, *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, DSSD/03-DM, September 2004, pp. 1-1–1-5. See Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs” and Chapter 11, “Legal Issues,” for more information on sampling, estimation, and the debate over sampling.

¹⁵⁴ U.S. Census Bureau, “Executive State of the Census Report as of October 13, 2000,” Report No. 35, October 20, 2000, p. 16; U.S. Census Bureau, “Executive State of the Census Report as of September 22, 2000,” Report No. 32, September 29, 2000, p. 20; U.S. Census Bureau, “Executive State of the Census Report as of September 15, 2000,” Report No. 31, September 22, 2000, p. 18; U.S. Census Bureau, “Executive State of the Census Report as of September 29, 2000,” Report No. 33, October 6, 2000, p. 17; U.S. Census Bureau, “Executive State of the Census Report as of November 3, 2000,” Report No. 38, November 9, 2000, p. 18.

Table 5-6.
Local Census Office Closeout Schedule

Wave	Total number of LCOs	Planned closeout date	Actual closeout date
1	10	August 31, 2000	August 31, 2000
2	158	September 15, 2000	September 15, 2000
3	309	September 30, 2000	September 30, 2000
4	36	October 13, 2000	October 13, 2000
5	7	October 31, 2000	October 26, 2000

When an LCO completed all field operations, the office manager was responsible for preparing the office for closeout. During closeout, the office manager ensured that the LCO staff shredded sensitive materials and packed and shipped all specified materials, including administrative materials, to the National Processing Center warehouse or other designated location. The Field Division provided LCOs with detailed instructions and checklists for closeout activities. In addition to the removal of materials and supplies, which began during the first three weeks of the 45-day closure period, closeout procedures included the removal and return of leased furniture, office equipment, automation equipment, and telecommunications systems.¹⁵⁵

Closing of the LCOs was followed by the closing of the RCCs. Unlike LCOs, which followed a predetermined closeout schedule, RCCs closed as they completed field operations. New York touched off the RCC closeout process with its closing on October 31, 2000. It was followed by the closing of the Kansas City and Chicago RCCs in December 2000. The final RCC to complete field operations was Charlotte, NC. (See Appendix B for full closeout schedule.)¹⁵⁶

¹⁵⁵ U.S. Census Bureau, "Program Master Plan for Field Office Management and Administration," p. 16.

¹⁵⁶ At the end of the census, the Census Bureau and General Services Administration (GSA) conducted a rent reconciliation. It was found that GSA had overcharged the Census Bureau for services. The two agencies devised a repayment strategy. U.S. General Accounting Office, "2000 Census Analysis of Fiscal Year 2000 Budget and Internal Control Weaknesses at the U.S. Census Bureau," GAO-02-30, December 2001, p. 14.

Chapter 6.**Data Capture and Processing**

INTRODUCTION	273
DATA CAPTURE OUTSOURCING	274
AUTOMATION INFRASTRUCTURE	284
Data Capture System 2000 (DCS2000)	285
Headquarters Processing	288
Management Information System (MIS2000)	292
DCSC Management Information System	292
ORGANIZATION AND LOGISTICS	293
Management Structure	294
NPC-DCC Management Structure	295
DCC Support Staff	295
DATA CAPTURE	295
Check-In and Document Preparation	296
Imaging	299
Optical Recognition	300
Keying	300
Quality Assurance	300
Checkout	303
Closeout	303
Forms Disposal	304
Data Archiving	304
HEADQUARTERS PROCESSING	305
Non-ID Processing	305
Decennial Response Files (DRF)	306
Primary Selection Algorithm (PSA)	307
Creation of the 100 Percent Census Unedited File (HCUF)	308
Housing Unit Status	308
Imputation	309
Count imputation	309
Characteristics imputation	310
Duplicate Delete Operation	311
Group Quarters Processing	312
Resolution of Missing Data	313
Processing of Responses With a Usual Home Elsewhere Address	313
Sample Census Unedited File (SCUF)	314
Detail File Creation	314

Chapter 6: Data Capture and Processing

INTRODUCTION

The interaction of two complementary trends defined Census 2000 data processing. An unprecedented reliance on automation in the collection and capture of census information combined with an array of response methods, including paper questionnaires, telephone interviews, Internet questionnaires, and “Be Counted” forms, to create an intricate web of duplicate data to be disentangled during the processing phase. Census 2000 data processing consisted of two distinct components: data capture and headquarters processing.

Paper questionnaires arrived at one of the U.S. Census Bureau’s data capture centers and were shepherded, both manually and mechanically, through the data capture process. They were sorted, scanned, and passed through a digital imaging device. Next they went through a system that used optical mark recognition to read categorical (checkbox type) responses and used optical character recognition to, when possible, interpret and automatically convert written responses to a machine-readable format, American Standard Code for Information Interchange (ASCII), for later review and use. Responses not readable by the device were manually keyed and converted to ASCII. Once captured, the data were transferred to headquarters to complete the processing needed to create the final census data products.

At headquarters, response data from all sources were compiled into the decennial response file. A screening algorithm called the primary selection algorithm was applied to the file in order to identify single housing units with more than one response, to compare multiple responses, and to determine which responses would represent the unit. Decennial response file write-in responses were coded, and the final version of the decennial response file as well as the decennial master address file were used in combination to create the census unedited file. The census unedited file combined individual response data (including names) with address status and operational data from the decennial master address file for every housing unit and persons living in group quarters.¹ Data gained through the statistical process editing and imputation were used to complete partial responses and correct inconsistencies.² The coding process provided numeric codes to arrange and classify written responses about race and Hispanic origin for tabulation. Finally, the Census Bureau assigned tabulation geography codes to the responses contained in the 100 percent census edited file to produce the 100 percent edited detail file. The Census Bureau then applied disclosure avoidance techniques to the individual responses contained in the 100 percent edited detail file and used the resulting data to produce Census 2000 data products and other tabulations based on 100 percent items. A separate process was used to create the sample edited detail file, which included sample data about housing units, their residents, and the group quarters population enumerated on long forms—about 1 in 6 housing units and group quarters persons nationwide.

¹ All people not living in housing units are classified by the Census Bureau as living in group quarters. Two general types of group quarters are recognized: institutional (e.g., nursing homes, mental hospitals, and prison wards) and noninstitutional (e.g., college or university dormitories, military barracks, group homes, and shelters). Group quarters may have housing units on the premises for staff or guests. Much of the processing (including unduplication) pertaining to group quarters was conducted independently of that for the housing unit universe. For more information about the enumeration of group quarters, see Chapter 5, “Data Collection.”

² Imputation relies on the tendency of households of the same size within a small geographic area to be similar in most characteristics. For example, the value of “rented” is likely to be imputed for a housing unit not reporting on owner/renter status in a neighborhood with multiunits or apartments where other respondents reported “rented” on the census questionnaire. There are two major types of imputation: (1) allocation, in which missing values for individual items are filled in on the basis of other reported information for the person or household (or from other persons or households with similar characteristics) and (2) substitution, in which *all* of the information for all the people in a household is created from other persons or households with similar characteristics. The imputation process is discussed in greater detail later in this chapter.

DATA CAPTURE OUTSOURCING

Marking a significant departure from past practices, the Census Bureau outsourced the two major components of the Census 2000 data capture program. The two components were the Data Capture System 2000 (DCS2000), which was awarded to Lockheed Martin Corp., and the data capture services contract (DCSC), awarded to TRW Inc. Lockheed Martin provided the equipment for imaging and data keying as well as the processing systems for the four data capture centers. TRW provided staff and services for data capture, facilities management, office equipment, supplies, and office automation for three of the data capture centers (DCCs). A fourth DCC was managed by the Census Bureau's National Processing Center (NPC).³

In past censuses, in-house technical experts designed, developed, deployed, and maintained the Census Bureau's data capture system. During the 1990 census, the internally developed FACT90 system successfully combined a film optical sensing device for input to computers (FOSDIC) and automated camera technology for data capture marking a significant advance in census data capture with the first use of concurrent processing.⁴ FACT90 photographed census questionnaires and passed the processed microfilm through the FOSDIC system, which used optical mark recognition (OMR) to distinguish differences in marks on the page images and convert the data to machine-readable code. Handwritten responses were sent to workstations where they were keyed manually.⁵

Despite the technological successes of the FACT90 system, a significant undercount and larger than expected total operational cost of the census troubled many in Congress. In October 1991, Congress passed the Decennial Census Improvement Act (Public Law 102-135) instructing the Census Bureau to work closely with the National Academy of Sciences (NAS) to redesign, or in the parlance of the day, "reengineer," the census to focus on cost-effective methods and greater statistical accuracy. NAS and the Census Bureau agreed on a plan combining traditional enumeration of 90 percent of the population with a "statistically accurate" count of the remaining 10 percent based on a sampling of nonrespondents during nonresponse follow-up (NRFU). Endorsed by several scientific organizations, this plan also called for a separate survey, based on a sample size of 750,000 households, designed to use statistical adjustment to correct for the anticipated undercount.⁶

By 1993, with planning for Census 2000 underway and the deadline for the 1995 Census Test rapidly approaching, the Census Bureau's Technical Services Division (TSD) faced substantial challenges. The Clinton Administration's efforts to streamline the government, a hiring freeze, and the Census Bureau's reduced budget combined to severely restrict plans for hiring experts or to provide necessary resources or training of personnel responsible for researching and developing the state-of-the-art system for electronic imaging needed for data capture.⁷ To meet these challenges, TSD formed a unique research and development partnership with a leading imaging expert, the Rochester Institute of Technology Research Corporation (RITRC). This partnership provided TSD

³ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Census 2000 Data Capture System Requirements Study," Census 2000 Evaluation No. R.3.d., August 23, 2002, p. 1.

⁴ The FOSDIC optical mark recognition system—used since the 1960 census—located information on the questionnaires by calibrating the pages on the microfilm roll, referring to three marks to check the vertical and horizontal dimensions. Once it detected the data marks, FOSDIC used light sensors to measure the contrast in light intensity between the page and the filled-in dots (dark and light images, respectively, on the microfilm frame), identifying the answers on the questionnaire.

⁵ For more information on the FACT90 system and data capture, see *1990 Census of Population and Housing History, Part C*, 1990 CPH-R-2C, (Washington, DC: Government Printing Office, 1995), pp. 8-6-8-29; John S. Rotegard, Alan J. Berlinger, Paul R. Friday, U.S. Census Bureau, "Data Capture and Questionnaire Printing for the 1990 Decennial Census," undated, Census Authors Collection, #2666, Census Bureau Library, Suitland, MD; Paul Friday, Technical Services Division, U.S. Census Bureau, "Automation of the 1990 Data Collection and Data Capture Processes," planning paper, January 1984, Census Authors Collection #6348, Census Bureau Library, Suitland, MD.

⁶ "Decennial Census Improvement Act of 1991," Public Law No. 102-135, 105 Stat. 635 (1991); National Research Council, Duane L. Steffey and Norman M. Bradburn, eds., *Counting People in the Information Age*, (Washington, DC: National Academy Press, 1994); U.S. Census Monitoring Board, Presidential Members, report to Congress, February 1, 1999, (Government Printing Office, Washington, DC), pp. 1-2; Martha Farnsworth Riche, New York, to Shannon L. Parsley, Suitland, MD, U.S. Census Bureau, letter, September 22, 2005.

⁷ Until its dissolution in 1996, the Technical Services Division designed, developed, deployed, and produced automated technology for census data processing.

employees with training in the latest computer languages and digital imaging technologies required to write the functional specifications for the Census 2000 data capture system. In return, RITRC gained valuable insights from Census Bureau personnel in the business of paper handling and designing and conducting censuses and surveys.⁸ In addition to its partnership with RITRC, the Census Bureau commissioned a number of assessments of available data collection technologies and, in cooperation with the National Institute of Standards and Technology (NIST), sponsored ongoing research into optical character recognition (OCR).⁹

OCR technology uses optical scanning and software designed to interpret handwritten characters. Source materials are scanned and converted to bitmapped digital images that consist of collections of pixels. OCR software processes a scanned image, differentiating between images and text to determine what letters are represented in the light and dark areas. OCR engines apply algorithms to analyze the stroke edge of a character, match the results to known characters in predetermined dictionaries, and make a guess as to the character represented. The computer's guess is expressed in a confidence interval assigned to the character interpretation by averaging the results from all the algorithms. While it is possible to adjust the scanning resolution or refine the results referenced by OCR software to increase accuracy, it is important to note that smudges, stray marks, or background color can fool the recognition software.¹⁰ OCR interprets fields independently, where the keying process permits keyers to interpret responses in a way that reflects the document in its entirety, including handwriting quality, and in the context in which the questionnaire is completed.

During the 1995 Census Test, Census Bureau personnel designed and tested a prototype digital imaging system combining OMR and OCR. The test assessed the feasibility of using digital imaging technology that combined, where necessary, customized commercial off-the-shelf software (COTS) with agency-developed programs to capture data from respondent-friendly census forms. Test results showed that the scanning project was a success. Despite considerable technological concerns about the accuracy of OCR, the prototype, including the mechanical forms feeder and the electronic imaging unit, proved "capable of handling the required volume and producing the image quality necessary to capture data electronically." In the final report on the prototype, technical experts from Recognition Research Inc., as well as imaging expert Jon Geist of NIST and the developer of the IDIAP Research Institute OCR engine, Thomas Breuel,¹¹ while emphasizing the importance of "human recognition" in the data capture process, agreed the 1995 test proved the agency could "use user-friendly forms while significantly reducing the data capture costs."¹² Citing the importance of institutional knowledge, these experts contended that while the technology

⁸ Ann Gwynn, "Partnership Agreement Big Step Towards Improving Data Capture Technology for 2000 Census," *U.S. Census Bureau IT Bulletin*, March 28, 1995, pp. 1–3; U.S. Census Bureau, "1993 Information Technology Plan," April 3, 1992, pp. 9–13. The partnership with RITRC was not a formal contract but was based on a memorandum of understanding.

⁹ Synectics for Management Decisions Inc., "Assessing Data Capture Technologies for the Year 2000 Census," report submitted to U.S. Census Bureau (Contract No. 50-YABC-3-66005), January 1994; Ogden Government Services and IDC Government, "U.S. Bureau of the Census Technology Assessment of Data Collection Technologies for the Year 2000: Final Technology Assessment Report," Deliverable No. 4 Data Collection Technologies Report and Recommendations, prepared for U.S. Census Bureau Year 2000 staff (Contract No. GSOOK90AJD0621), April 19, 1993; R. Allen Wilkinson, et al., "The First Census Optical Character Recognition System Conference," NISTIR 4912, August 1992; Jon Geist, et al., "The Second Census Optical Character Recognition Systems Conference," NISTIR 5452, May 1994.

¹⁰ For more information on questionnaire design and its influence on data capture, see Chapter 3, "Population and Housing Questions."

¹¹ The IDIAP Research Institute, initially referred to as "Institut Dalle Molle d'Intelligence Artificielle Perceptive" (Dalle Molle Institute for Perceptual Artificial Intelligence), was founded in 1991 by the Dalle Molle Foundation as the third of three research institutes in Switzerland. Dr. Thomas Breuel served as a consultant to the U.S. Census Bureau between 1994 and 1996 before working at the IBM Almaden Research Center, where he provided technological support for IBM's DCS2000 team in its bid for the DCS2000 contract. See also Thomas M. Breuel, "Applying Handwriting Recognition to U.S. Census Forms," in Appendix C of U.S. Census Bureau, "Electronic Imaging and Data Capture System Prototype for the 1995 Census Test," Final Report, February 1996 and Thomas M. Breuel, "Applying Handwriting Recognition to U.S. Census Forms," Proceedings of Second Asian Conference on Computer Vision, ACCV '95, Vol. 3, 1995, pp. 383–87.

¹² Jon Geist, "Evaluation Report for Processing Office #A85: Preparation and Preliminary Scoring of the Evaluation File for the 1995 Census Test of Image-Based Capture Technologies," October 31, 1995, p. 8, in Appendix D of U.S. Census Bureau, "Electronic Imaging and Data Capture System Prototype for the 1995 Census Test," Final Report, February 1996.

was available and usable through private industry, the greatest risk was not the technology but rather “the ability of the [Census] Bureau to adequately manage this revolutionary change.”¹³

The 1990s saw rapid technological advances and increased support of a businesslike approach to government called “privatization.” The National Performance Review urged executive agencies to improve their programs or reduce costs through collaboration with or transfer of certain government activities to private sector firms.¹⁴ By the fall of 1995, Census Bureau officials were discussing a variety of ways to privatize Census 2000 activities. Included as “candidates for divestiture” were field data collection, payroll support, telecommunications, printing, promotion, quality assurance, and technology systems integration. Noting that outsourcing data capture and related decennial systems would be a significant departure from the agency’s history of utilizing in-house expertise, Census Bureau officials nonetheless promoted a divestiture of computer software design, engineering, installation, and testing.¹⁵

In 1995, the Census Bureau established the Decennial Systems and Contracts Management Office (DSCMO) to manage Census 2000 contracts.¹⁶ Early in 1996, the Census Bureau commissioned Advanced Resource Technologies Inc. (ARTI) to conduct a benefit/cost analysis (BCA) of feasible approaches to performing data capture for Census 2000. With a focus on maximizing the quality of the data captured in a cost-efficient manner, this study compared the costs, risks, and benefits of three alternatives for data capture architecture, including digital imaging using OMR and OCR, the updating of the FACT90 system, and manual data entry. The BCA determined that digital imaging represented the least expensive alternative, requiring only four data capture centers (DCCs) with a staff of approximately 2,160 keyers, and an estimated total life cycle cost of \$113 million. However, given the system architecture’s complexity and the fact that the technology was untested in census operations, the digital imaging alternative also presented a substantial technological and operational risk.¹⁷ The second alternative, updating the FACT90 system, relied on high-speed cameras filming each form and used the FOSDIC OMR device to capture check mark responses from the forms. Workstations would then be used to key handwritten data from the paper forms. This alternative required seven DCCs and approximately 7,060 keyers. Although this alternative proved successful in previous censuses, the FACT90 system required some restructuring to incorporate new optics technology and to accommodate the redesigned census forms and the anticipated increase in the workload for Census 2000. ARTI noted that at the writing of the BCA, the Census Bureau had not begun a redesign and refurbishment effort. The third alternative, manual keying, presented the least amount of technical risk to the Census Bureau. However, it would require eight DCCs and over 8,000 data entry clerks; accordingly, ARTI stated that manual

¹³ Recognition Research Incorporated, “1995 Decennial Census Prototype: Final Report,” November 6, 1995 pp. 23–24 in Appendix B of U.S. Census Bureau, “Electronic Imaging and Data Capture System Prototype for the 1995 Census Test,” Final Report, February 1996. For technical information on the 1995 Census Test, see Chapter 2, “Planning the Census.”

¹⁴ Created on March 3, 1993, the National Partnership for Reinventing Government (NPR), originally the National Performance Review, was the Clinton-Gore Administration’s interagency task force to reform and streamline federal government activities by promoting efficiency and cost-reducing practices.

¹⁵ John H. Thompson, U.S. Census Bureau, “Census 2000: The Divestiture of Decennial Program Activities,” 2000 Decennial Census Decennial Management Division Memorandum (N.E.C.) No. 95-05, November 29, 1995, pp. 1–7.

¹⁶ Established in 1995, DSCMO was responsible for contracting for Census 2000. According to the Department Organizational Orders, “The Decennial Systems and Contracts Management Office shall manage the development and implementation of major Census 2000 contracts, including development and implementation of data capture system, acquisition and hardware, software, telecommunications, and integration services required to support the temporary offices, acquisition of other support such as printing of census forms, and conduct of telephone questionnaire assistance; ensure that all requirements, functions, and system interfaces for contracted systems are identified and compatible; ensure that all hardware and software are adequate and that all charges are controlled; monitor the cost and schedule, and technical performance milestones for each system, and ensure that appropriate standards and supportability requirements are established and met; manage the development of software and systems necessary to support processing and tabulation of census data; be responsible for integration of systems necessary to support collection, processing, and tabulation systems, including management of a Beta site contract to support this integration effort.” U.S. Department of Commerce, Bureau of Economic Affairs, Bureau of the Census, Department Organizational Order 35-2B, Amendment 3, effective date: April 2, 1999.

¹⁷ The digital imaging alternative was given a weighted risk rating of second out of the three alternatives examined, with FACT90 refurbishment ranking highest. Advanced Resource Technologies Inc., *Benefit/Cost Analysis of the 2000 Census Data Capture Scenario*, Vol. 1, Final, February 1996, pp. 8-1–8-22.

keying presented greater operational costs. In its conclusion, ARTI recommended that the Census Bureau use imaging technology for data capture for Census 2000. It advised the agency to reduce the level of technical risk associated with this alternative by “implementing such an architecture and using it for some other large production census or survey application scheduled for, ideally two or three years prior to the 2000 census.”¹⁸ Census Bureau officials accepted the ARTI recommendations.¹⁹

Between February and August 1996, Census Bureau experts developed requirements and specifications for an appropriate optical scanning system and related equipment, discussed alternative contracting procedures, and designated the parameters of a system to capture information contained in tens of millions of census forms the agency would receive during Census 2000. The agency initially planned to use a “fly-off” acquisition strategy in which two contractors’ DCS2000 prototypes would be completed during the development phase. By May 1996, the Census Bureau changed its acquisition strategy in favor of a single-vendor approach.²⁰ In its assessment of the DCS2000 acquisition procedures, the Office of Inspector General (OIG) of the U.S. Department of Commerce endorsed the Census Bureau’s decision to outsource data capture but recommended placing greater emphasis on technical content requirements in its vendor selection process rather than on past performance and oral presentations.²¹

The Census Bureau revised its solicitation in line with OIG recommendations. In August 1996, the Census Bureau formally invited private sector firms to submit bids for a state-of-the-art data capture system for Census 2000. Bidders were directed to the Census Bureau Procurement Office for information relating to the contract and to K. Bradley Paxton of RITRC for technical information and blueprints for the DS250—the paper transport system used in Census Bureau imaging and microfilming projects.²²

To be awarded the DCS2000 contract, the selected bidder’s system required the ability to capture information from an estimated 1 billion pages of census forms within a 99-day period (March 8 to July 1, 2000), as well as:

- The ability to begin processing at peak performance levels on March 8, 2000, with no phase-in period.
- The flexibility to handle forms of variable length and format.²³

The Census Bureau also required the DCS2000 system to contain five specific subsystems and use commercially available software where feasible. The component subsystems were:

- *Check-in*: The hardware and software necessary to read and store unique bar code identifiers on incoming envelopes and provide daily check-in rates and related data to the Census Bureau.
- *Imaging*: The subsystem to scan completed census forms and prepare the resulting images for the optical recognition and key-from-image processes. Proposals were to take into consideration the Census Bureau’s goal of automating data capture, including minimizing the number of people required to key data into the system.

¹⁸ Advanced Resource Technologies Inc., *Benefit/Cost Analysis of the 2000 Census Data Capture Scenario*, Vol. 1, Final, February 1996, p. xii.

¹⁹ John H. Thompson to Robert Marx, U.S. Census Bureau, “Recommendation that the Census Bureau Use Imaging Technology to Perform the Data Capture Function for the 2000 Census,” DMD Decision Memorandum No. 1, February 21, 1996 (originally issued as DMD to Director Memorandum No. 96-09).

²⁰ Robert W. Marx, Associate Director for Decennial Census to Division Chiefs Council, et al., “DCS2000 Contract—Decision to Use Single Vendor Approach,” memorandum, May 17, 1996; Office of Inspector General, “Bureau of the Census: Data Capture System 2000 Needs Acquisition and Management Improvements, Final Report,” OSE-7329-6-0001, July 1996.

²¹ Office of Inspector General, “Bureau of the Census: Data Capture System 2000 Needs Acquisition and Management Improvements, Final Report,” OSE-7329-6-0001, July 1996, pp. 6–9.

²² “DCS2000 SOL 52-SOBC-6-00003: Solicitation for Data Capture System for the Year 2000 Decennial Census,” *Commerce Business Daily*, PSA No. 1652, August 6, 1996. For more information on the requirements and deliverables detailed in the DCS2000 contract, see statement of work for contract No. 50-YABC-7-66010.

²³ Since the content and format of Census 2000 data-collection forms would not be finalized until 1999, and data capture workloads would differ substantially from one DCC to another, it was necessary for DCS2000 to be a scalable system capable of capturing data from questionnaires of different lengths and layouts.

- *Optical recognition*: The subsystem using OMR and OCR to read and interpret handwritten responses on questionnaire images.
- *Key from image (KFI)*: The subsystem where data from scanned images rejected by OCR and OMR would be keyed.
- *Automated edit resolution*: A subsystem to identify missing names and data from images of scanned questionnaires or from ASCII files created from those images.²⁴

In addition, the solicitation required a workflow management system that allowed for control of each subsystem and the exchange of information among them.

Four companies submitted proposals for DCS2000 to the Census Bureau by October 1996. The Census Bureau used three primary criteria to determine the winning bid. These were past performance on similar efforts; the capabilities of key people, including their roles in previous efforts; and the ability to plan, design, and demonstrate products and processes during preaward demonstrations.²⁵ After 6 months of evaluation, the Census Bureau awarded the DCS2000 contract, valued at \$150.5 million, to Lockheed Martin Mission Systems on March 21, 1997.²⁶

In addition to the contract for the data capture system, the Census Bureau awarded to TRW in February 1998 the data capture services contract (DCSC), which included the acquisition, build-out, operation, and closeout of data capture facilities. Both contracts included a cost-plus award fee with elements of firm-fixed price in order to share risk between the government and the contractors.²⁷

The DCS2000 solicitation specified a two-phase process. The first phase covered the design and development of a prototype DCS2000 system at the Census Bureau's computer facility in Bowie, MD. Extending from March 21, 1997, to July 31, 1998, Phase 1 included several demonstrations designed to allow the Census Bureau to assess Lockheed Martin's progress in designing, constructing, operating, and refining the preproduction data capture system to be used in the Census 2000 Dress Rehearsal in 1998. Phase 2 of the contract was the development and deployment of the full-scale production version to be used for Census 2000.

The DCS2000 contract specified that the data capture system would be developed in four increments during Phase 1, with each increment adding capabilities to the system. Interim releases of the system would follow the completion of each increment. Each release would be subject to a milestone demonstration referred to as Levels B, C, and D. The Level B demonstration focused on basic scanning and forms processing capabilities. This demonstration consisted of a practice run processing 1,064 census forms to test the imaging, optical recognition, key-from-image, and workflow management subsystems. Among the problems discovered in the demonstrations were pages sticking together and duplication of identification codes.

The Level C demonstration was to test the system's ability to process 10,000 census short forms and 2,000 long forms in one workday consisting of two 8-hour shifts. Initially the Census Bureau intended to provide the contractor with 12,000 forms from a census test planned for 1997. Lack of funding required the agency to substitute a limited test deck of 2,000 forms completed by census staff.

²⁴ The Census Bureau promised to work with the contractor during the first 60 days following the award to develop a methodology for identifying and resolving edit failures.

²⁵ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Census 2000 Data Capture System Requirements Study," Census 2000 Evaluation No. R.3.d., August 23, 2002, p. 11.

²⁶ U.S. Census Bureau, "Program Master Plan: Data Capture Systems and Operations," March 30, 2001, pp. 2–3; Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Census 2000 Data Capture System Requirements Study," Census 2000 Evaluation No. R.3.d., August 23, 2002, p. 10; Carolyn Hirschman, "Head Count: Census Bureau Taps Data Management Tools," *Washington Technology*, August 2, 1999; Pamela Bowers, "The Bureau of the Census Delivers the First System to Use Digital Imaging Technologies to Process Forms," *Crosstalk: The Journal of Defense Software Engineering*, January 2002, pp. 12–13. The DCS2000 contract was awarded in accordance with information systems acquisition guidelines established by the U.S. Office of Management and Budget in Memorandum No. M-97-02, October 25, 1996, under the Information Technology Management Reform Act of 1995 (40 U.S. Code 1401 et seq.) and Executive Order 13011 regarding federal information technology management, *Federal Register*, Vol. 61, No. 140, July 19, 1996, pp. 37657–62.

²⁷ U.S. Census Bureau, "Program Master Plan: Data Capture Systems and Operations," Census 2000 Informational Memorandum No. 107, March 30, 2001, pp. 2–3.

According to the DCS2000 contract, the Census 2000 Dress Rehearsal would serve as the Level D demonstration.²⁸ The dress rehearsal provided the Census Bureau its first opportunity to test the new system with questionnaires completed by the public. Analysis of dress rehearsal results revealed a number of problems with the data capture system including:

- Missing data.
- Misinterpretation of responses.
- Sorter jams.
- A field-error rate for write-in responses of 3.01 percent.²⁹

According to the OIG, however, these tests were too limited in size and scope to replicate the actual operational environment for the DCS2000. Specifically, the DCS2000 system tested in the dress rehearsal lacked its full complement of equipment (e.g., scanners and workstations). This, combined with continued changes in system requirements and the abandonment of an agreed-upon software and hardware test process, meant DCS2000 could not be considered a fully operational production system.³⁰

The Census Bureau responded with efforts to improve its management of the DCS2000 contract and system development. This included replacing the statement of work (SOW), which was used to outline the tasks in the DCS2000 contract with a Functional Baseline (FBL) document. Because the FBL lacked specifics needed for effective management, the Census Bureau and Lockheed Martin continued to negotiate refinements of system requirements as needed throughout the course of the project.³¹

On October 30, 1998, DSCMO established a Requirements Change Request Management Process mandating that any change to system requirements undergo a review by the Census Operational Managers (COM) and the Issue Resolution/Change Control Board (IR/CCB). Both groups consisted of assistant division chiefs from the Decennial Management Division (DMD) and all lead census managers involved in decennial operations. These bodies evaluated the budgetary and operational risks posed by proposed requirements changes and then either rejected the proposed change or referred it to the assistant to the associate director (AAD) for the Decennial Census for final disposition. In addition to the change-control process, the Data Capture Programming Office (DCPO) of the Census Bureau and Lockheed Martin compiled and updated a list of outstanding requirements, schedules for defining such requirements, and cost estimates for accommodating those requirements not included in baseline funding.³²

After several modifications of the system requirements, software, and the DCS2000 contract, the Census Bureau tested the DCS2000 system in a production setting. Beginning on July 12, 1999, the Company Statistics Division of the Census Bureau's Economic Directorate used Lockheed Martin's system to test data capture using the 1997 Survey of Minority-Owned Business Enterprises and the 1997 Survey of Women-Owned Business Enterprises (SMOBE/SWOBE). From July 26 to 30, an end-to-end test of the Lockheed Martin system conducted at the National Processing Center

²⁸ See statement of work in Contract No. 50-YABC-7-66010. Refer also to Lockheed Martin Mission Systems, "DCS2000 System Acceptance Test Plan," Contract No. 50-YABC-7-66010, Document No. DCS-98-044, submitted to U.S. Census Bureau, May 29, 1998, and attached government comments from Alan Berlinger, Decennial Systems Contract Management Office, U.S. Census Bureau, to Nancy E. Robinson, Lockheed Martin Federal Systems, "System Acceptance Test Plan Draft," ID# DCS2K-98-573, undated.

²⁹ Kevin D. Haley, Decennial Statistical Studies Division, U.S. Census Bureau, "Quality of the Data Capture System," Census 2000 Dress Rehearsal Evaluation Memorandum H3, July 1999, pp. i-vi; Lockheed Martin Mission Systems, "DCS2000 System Development Plan: Final," Contract No. 50-YABC-7-66010, Document No. DCS-97-072, submitted to U.S. Census Bureau, July 31, 1998, pp. 45-48, 90-92.

³⁰ U.S. Department of Commerce, Office of Inspector General, "Bureau of the Census: Data Capture System 2000 Requirements and Testing Issues Caused Dress Rehearsal Problems," final Inspection Report No. OSE-10846, January 1999.

³¹ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Census 2000 Data Capture System Requirements Study," Census 2000 Evaluation No. R.3.d., August 23, 2002, pp. 1-4.

³² Kenneth Prewitt, Director, U.S. Census Bureau, to Judith J. Gordon, Assistant Inspector General for Systems Evaluation, U.S. Department of Commerce, (January 26, 1999), Appendix A of U.S. Department of Commerce, Office of Inspector General, "Bureau of the Census: Data Capture System 2000 Requirements and Testing Issues Caused Dress Rehearsal Problems," Final Inspection Report No. OSE-10846, January 1999.

(NPC) revealed several problems with the prototype. On August 2, NPC staff processed a batch of 1,200 forms completely through the DCS2000 system. The NPC's quality assurance staff assessed data quality by reviewing for each form the images and the information guaranteed confidential under Title 13 (T-13) of the U.S. Code.

During biweekly meetings, the SMOBE/SWOBE and DSCMO staffs expressed concerns to Lockheed Martin about the number of false positive OMR errors and trouble tickets issued by NPC staff and Lockheed Martin staff since the start of production. The trouble tickets revealed "various problems with the sorters; cases found in the database with a check-in date and no T-13 data; cases with T-13 data but no check-in date; inconsistencies between the counts in the database and the production reports, and several problems with the checkout operation used to verify the [Census] Bureau's receipt of the data record for each processed form." In response to the evaluations of test decks and production reports, Lockheed Martin modified its program and software, including refining the truth files and dictionaries used by the system to interpret the characters in write-in responses.³³ After investigating the sources of these problems, NPC staff recommended several software and hardware enhancements to Lockheed Martin. NPC staff also devised and recommended an independent quality assurance (QA) procedure during which Census Bureau personnel would pull a stratified sample of the daily receipts, key the responses from the paper forms into an NPC system, and run a simple matching program to analyze discrepancies between the daily files provided by Lockheed Martin and the data keyed by NPC staff. NPC made recommendations about how to improve the system's capacity to alert staff about errors. Provided these recommendations did not constitute major system design changes or increase the risks associated with the cost or production schedule for the DCS2000, they were to be incorporated into the first build for the decennial census.³⁴

Once DCS2000 was installed in the DCCs for Census 2000, system testing proceeded through a series of stages (see Table 6-1). The first of these was the site acceptance test (SiteAT) at which the contractor, with occasional assistance from Census Bureau personnel, confirmed that the system and subsystems met specifications and that required functions had not regressed or reverted since the system acceptance tests.

Table 6-1.
Data Capture Center DCS 2000 Testing Schedule

DCC site	Site acceptance test		Operational test dry run		Four-site preproduction test	
	Planned	Actual	Planned	Actual	Planned	Actual
Baltimore, MD	7/8/1999	8/6/1999	8/9/1999	10/1/1999	2/22/2000	2/25/2000
NPC	12/2/1999	12/17/1999	1/3/2000	2/11/2000	2/22/2000	2/25/2000
Pomona, CA	9/20/1999	10/7/1999	10/18/1999	11/19/1999	2/22/2000	2/25/2000
Phoenix, AZ	12/3/1999	12/3/1999	11/29/1999	2/4/1999	2/22/2000	2/25/2000

Source: U.S. Census Bureau, "Program Master Plan: Data Capture Systems and Operations," Census 2000 Informational Memorandum No. 107, March 30, 2001, Attachment B: Master Activity Schedule for Data Capture as of 3/30/2001.

Upon completion of the SiteAT, TRW staff activated the system to prove that it met performance standards and ran the operational test dry run (OTDR). The OTDRs provided formal controlled environments in which every component of data capture operations was implemented, practiced, and evaluated. The contractors provided evaluations of the following individual elements based on OTDR results:³⁵

- Executing and recruiting the screening plan.

³³ Ruth A. Runyan, Assistant Division Chief, Surveys and Programs, Company Statistics Division, U.S. Census Bureau, to Ewen M. Wilson, Chief, Company Statistics Division, U.S. Census Bureau, "Summary of Phase II Operations/Response Rates, 1997 Survey of Minority-Owned Business Enterprises (SMOBE) and 1997 Survey of Women-Owned Business Enterprises (SWOBE)," memorandum, April 15, 2000, p. 3.

³⁴ Ruth A. Runyan, Assistant Division Chief, Surveys and Programs, Company Statistics Division, U.S. Census Bureau, to Ewen M. Wilson, Chief, Company Statistics Division, U.S. Census Bureau, "Summary of Phase II Operations/Response Rates, 1997 Survey of Minority-Owned Business Enterprises (SMOBE) and 1997 Survey of Women-Owned Business Enterprises (SWOBE)," memorandum, April 15, 2000, p. 2.

³⁵ U.S. Census Bureau, "Program Master Plan: Data Capture Systems and Operations," Census 2000 Informational Memorandum No. 107, March 30, 2001, pp. 53–54.

- Training methods and materials.
- Application of concepts and procedures outlined in the *Data Capture Operations Manual*.
- Assessment of QA measures.
- Communications with the Operations Control Center.
- Disaster recovery.

The OTDR as well as other tests in the Baltimore and Pomona DCCs demonstrated that keying took approximately twice as long as original projections, which were based on a keying rate of 8,500 keystrokes per hour. Census Bureau staff attributed the increased time requirement to a greater-than-expected level of critical QA work sent to keyers and to the discovery that keying rates were approximately half of the original projections.³⁶ The Census Bureau and the contractor adopted a two-pass data capture operation to avoid a dramatic processing slow down.³⁷ During Pass 1, only responses to 100 percent census items rejected by the OCR software were keyed from the digital images.³⁸ The second pass operation included a rerun of the long-form questionnaire images through OMR and OCR interpretation and the keying of write-in responses rejected by OCR.³⁹

Testing and requirements changes slowed development of the DCS2000, putting it 4 months behind schedule in late 1999. Nonetheless, in its assessment of the system, the GAO acknowledged the progress made by the Census Bureau and Lockheed Martin on the system's development. By January 7, 2000, the Census Bureau reported that "21 of 23 software releases had been completed and 6 of 10 major test events had been completed . . . [and] all DCS2000 hardware [was] installed at all sites." GAO reminded the production team that the March 6 project deadline was less than 2 months away. Further delay, said the GAO, might endanger the execution of a production-scale test of the final system, which in turn could pose a risk to the effectiveness of the Census 2000 data capture process. The Census Bureau generally concurred with the GAO's observations and noted that the agency had implemented a formal risk management program as well as a more stringent requirements management process to ensure that only those changes that were "justified on the basis of costs, benefits, and risks [were] approved and made."⁴⁰ As late as January 24, Census Bureau officials continued to express concerns about QA procedures, and they proposed a method by which NPC staff could monitor the quality of data capture. The proposed method suggested pulling sample images during the first pass and comparing them with the T-13 data captured by DCS2000. NPC would then monitor second-pass data capture by preparing keyed-in samples for comparison with T-13 and long-form data.⁴¹ In addition, the Census Bureau and the contractors scheduled a four-site preproduction test to assess the system's readiness prior to its coming on line.

Conducted on February 25, 2000, the four-site preproduction test was designed to demonstrate simultaneous operation at all four DCCs. Employing the DCS2000 equipment (including the final software) and the operations staff, all support staff and infrastructure, and the major interfaces

³⁶ Critical fields included the race check-box question. If a multiple response was detected for this question, the field was designated as "low confidence" and sent to an operator for manual keying.

³⁷ According to the U.S. Government Accounting Office (GAO), "changing DCS2000 to the two-pass approach resulted in estimated cost increases of \$33 million for additional system development, hardware, integration, testing, and support by the development contractor [Lockheed Martin]; and \$12 million for the contractor that operates the DCCs to keep the centers operational longer than originally planned [TRW]." U.S. General Accounting Office, "2000 Census: Update on Data Capture Operations and System," GAO/AIMD-00-324R, September 29, 2000, p. 4.

³⁸ Pass 1 of data capture began March 6 and concluded September 15, 2000. Pass 2 began on August 28 and ended on November 15, 2000.

³⁹ U.S. Census Bureau, "Program Master Plan: Data Capture Systems and Operations," Census 2000 Informational Memorandum No. 107, March 30, 2001, pp. 1-2. "100 percent data" refers to the six basic questions that appeared on both long- and short-form questionnaires, these questions ask about relationship, sex, age, race, ethnicity, and tenure.

⁴⁰ U.S. General Accounting Office, Report to the Subcommittee on the Census, Committee on Government Reform, House of Representatives, "2000 Census: New Data Capture System Progress and Risks," GAO/AIMD-00-61, February 2000, pp. 3-17.

⁴¹ Howard Hogan, Chief, Decennial Statistical Studies Division (DSSD), U.S. Census Bureau, "Proposal for Quality Assurance of Census 2000 Data Capture," DSSD Census 2000 Procedures and Operations Memorandum Series No. JJ-8, January 24, 2000.

with the Census Bureau and the Operations Control Center, the test ran regular 8-hour shifts with a minimum of 6.5 productive hours per day for 4 days at each of the four DCCs. The goal was to process approximately the same number of forms per shift as predicted during the Census 2000 data capture operations at each site. The three major objectives included tests of the following:

- *Operations:* Practice all procedure-based floor operations that were directly connected to moving census materials. This included the work of operations personnel, supervisors, and managers.
- *System:* Test all hardware and final software directly related to the collection and transmission of census data. Perform a final shakeout of the DCS2000 software using the production D.23 software release. Verify that all form templates and functionality were correct. Transmit daily T-13 data files to headquarters data processing from each of the four sites via the automated DCS2000 data transmission process.
- *Support:* Test all personnel, processes, procedures, hardware and software related to supporting the operations, including on-site support, operations help desk, and system technical support.⁴²

Upon completion of the tests, the contractor modified the system as needed and the DCS2000 was deployed for Census 2000 data capture on March 6, 2000. During Census 2000, agency personnel and TRW contractors operating the DCCs processed approximately 150 million forms using technologies developed and maintained by private firms. Following its mandate from Congress and the Administration, the Census Bureau applied private sector business practices to establish and maintain partnerships with contractors. The agency and TRW established consistent operational procedures for the DCCs, and keying approaches were modified to meet production schedules. To mitigate risks to the data capture program, control costs, and manage the numerous system requirements changes that were required throughout the development and testing of the DCS2000, the Census Bureau implemented a control process that tracked and evaluated changes. Census Bureau change control was complemented by similar efforts by Lockheed Martin and TRW. The effort required to complete the necessary assessments of change requests, however, diverted resources from the development and testing process.⁴³

The use of OCR and an outsourced data capture system marked significant departures from past technologies and practices. These changes resulted in a variety of unanticipated costs. The experience of outsourcing data capture for Census 2000 highlighted the Census Bureau's difficulties in capitalizing on or effectively managing the institutional knowledge and experience of its own personnel. This was due, in part, to the agency's limited documentation of user requirements from past censuses as well as its lack of experience working with contractors. Such difficulties, however, were more broadly indicative of a shift in institutional culture.⁴⁴

Limited utilization of institutional knowledge and a lack of documentation of decennial census requirements contributed to difficulties with three critical components of the data capture program: system requirements definition; rules for keying in data; and the establishment of QA processes.⁴⁵ While the Census Bureau planning for Census 2000 included a process to control changes, many Census Bureau actions were viewed by employees and evaluators as reactive rather than proactive. Frequent changes to the system requirements that were originally outlined in the request for proposals and the contract presented considerable difficulties. With each software release and subsequent test, the contractors and the Census Bureau identified new problems requiring system changes to meet production requirements and deadlines.

In addition to system requirements, keying rules and QA played a critical role in data capture. During Census 2000, when the DCS2000 could not identify a number or write-in character, an image of the field was forwarded to a keyer for entry. When an entire questionnaire could not be imaged,

⁴² U.S. Census Bureau, "Program Master Plan: Data Capture Systems and Operations," Census 2000 Informational Memorandum No. 107, March 30, 2001, p. 54.

⁴³ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Census 2000 Data Capture System Requirements Study," Census 2000 Evaluation No. R.3.d, August 23, 2002, pp. 1–12.

⁴⁴ IBM Business Consulting Services, "Management Evaluation of Census 2000, Final Report," Census 2000 Evaluation Q.1, October 8, 2003, pp. 67–71.

⁴⁵ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, "Census 2000 Data Capture System Requirements Study," Census 2000 Evaluation No. R.3.d, August 23, 2002, p. 6.

keyers entered data from the document itself. A number of other questionnaires were not imaged but were keyed directly from the relevant document. Initially, keying rules similar to those used in the 1990 census were proposed for Census 2000; however, philosophical differences among Census Bureau experts in content and processing on the amount of interpretation that should be done by the keyer proved a stumbling block.⁴⁶ The method used by NPC keyers with years of experience interpreting responses was not readily translatable by contractors new to the job and with minimal supervision or guidance, and so a “key what you see” that did not provide for interpretation of respondent intent was adopted. Adding to the confusion, keying rules continued to change even after production began and between first- and second-pass operations.

Differences over QA procedures also presented challenges to the program. Although Census Bureau QA specialists provided contractors with recommendations for improving QA procedures, these were received late in the process. Specialists were informed that implementing such procedures would require software redesign. As a result, primary contractors developed internal QA programs, and philosophical differences between agency QA specialists and program managers over the implementation of QA contributed to uncertainty among QA specialists. Time limitations and other factors required the use of process workarounds that did not always meet the Census Bureau’s QA requirements.⁴⁷

Such differences in the interpretation of procedures and system requirements not only contributed to misunderstandings between agency personnel and contractors, but increased program costs. Often, the modifications necessary for a timely and successful data capture program fell outside the original contractual obligations. In a number of circumstances, the increased resources required to accommodate these system or program changes required change orders, or modifications of the contracts, which were awarded on a “cost plus” basis. Change orders were priced separately from the original contracts, and they added to the contracts’ scope and value.⁴⁸ By December 2001, the Census Bureau reported the combined total cost of the data capture contracts at \$552 million, with \$237,564,461 awarded to Lockheed Martin Mission Systems for the DCS2000 (Phases 1 and 2), and \$314,282,740 awarded to TRW for the DCSC.⁴⁹ Table 6-2 includes those modifications that most significantly increased costs of the data capture program.

⁴⁶ Keying rules submitted by Census Bureau subject-matter experts instructed keyers how to interpret responses rather than using a “key what you see” method. These rules were not incorporated into Census 2000 keying procedures. See Howard Hogan, Chief, DSSD, John F. Long, Chief, Population, and Daniel H. Weinberg, Chief, Housing and Household Economics Statistics, U.S. Census Bureau, to Preston Jay Waite, Assistant to the Associate Director for Decennial Census, U.S. Census Bureau, “Special Keying Data Capture Procedures and Instructions for Data Capture System 2000,” memorandum, April 20, 1999.

⁴⁷ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, “Census 2000 Data Capture System Requirements Study,” Census 2000 Evaluation No. R.3.d., August 23, 2002, pp. 1–12.

⁴⁸ IBM Business Consulting Services, “Management Evaluation of Census 2000, Final Report,” Census 2000 Evaluation Q.1, October 8, 2003, pp. 67–71.

⁴⁹ Titan Systems Corporation/System Resources Division, Kevin A. Shaw, “Census 2000 Data Capture System Requirements Study,” Census 2000 Evaluation No. R.3.d., August 23, 2002, pp. 1–12; U.S. U.S. General Accounting Office, “2000 Census: Analysis of Fiscal Year 2000 Budget and Internal Control Weaknesses at the U.S. Census Bureau,” Appendix IV: Comments from the Department of Commerce, U.S. Census Bureau, GAO-02-30, December 2001. A third phase was added to the DCS2000 contract to prepare DCS2000 images and an index to those 625 million form images for microfilm. This was to meet federal archiving requirements. See National Archives and Records Administration, SF-115 for Job No. N1-29-00-2, “Census 2000 Comprehensive Record Schedule,” June 14, 2000, and “Extension to Contract No. 50-YABC-7-66010 for the Transition of the Production DCS2000 Systems to a Post-Decennial Environment,” *Commerce Business Daily*, PSA No. 2737, November 30, 2000.

Table 6-2.
Data Capture Contract Costs
 [In dollars]

DCS2000 Contract	
Original contract baseline	48,971,085
Modification	Cost
Phase 1 system requirements based on functional baseline	24,028,427
Phase 2 system development	64,333,746
Six-person form	9,329,010
Data capture audit resolution	1,491,472
Additional workstations for Baltimore and Phoenix DCCs	2,888,333
Additional hardware for Baltimore and Phoenix DCCs	4,645,602
Bar code capture development and questionnaire changes	2,791,875
System modifications based on a traditional census	19,676,102
System and operational changes from a one-pass to a two-pass system	32,843,120
Phase 3 image retrieval system development for archiving	17,000,000
Phase 3 microfilming of questionnaire images for archiving	27,000,000
Final estimated cost (FY2003)	219,746,000
Data Capture Services Contract	
Original contract baseline	187,872,104
Modification	Cost
Life-cycle cost-estimated baseline	40,834,005
Six-person form, traditional census, and two-pass processing changes	91,238,630
Lease for Lanham office	1,537,673
Four-site production test	2,000,000
Document destruction at the DCCs	1,042,511
Enumerator forms storage based on Congressional request to investigate possible fraud	2,000,000
Administrative changes resulting in decrease in costs	-3,242,957
Final budgeted total	314,279,740

Source: U.S. Census Bureau, "Assessment Report: Data Capture of Paper Questionnaires, Final," Census 2000 Informational Memorandum No. 135, February 19, 2003, pp. 19, 27–29.

Despite such challenges, the use of contractors provided a number of benefits. Contractors brought considerable expertise and resources, contributing to the timely completion of data capture for Census 2000. The Census Bureau's first foray into outsourcing on this scale revealed a number of shortcomings, which encouraged it to alter its approach to program development and decision-making practices.

AUTOMATION INFRASTRUCTURE

The Census Bureau based its automation of the data capture and headquarters (HQ) processing programs largely upon the interaction of three major census systems, each with its own sub-systems:

- Data Capture System 2000 (DCS2000)
- HQ processing
- Management Information System (MIS2000)

The data capture services contract (DCSC) management information system (DMIS), a management information system contained within the data capture centers (DCCs), also played a part. The DCS2000's primary function was to capture Title 13 data from census forms as American Standard Code for Information Interchange (ASCII) text. DCCs received forms mailed back from respondents as well as other types of forms from field offices. At the DCCs, these forms were checked-in, sorted, and scanned to produce a digital image of the form. The scanned images underwent optical mark recognition (OMR) and optical character recognition (OCR) interpretation to obtain the Title 13 ASCII data. On a daily basis, DCCs transmitted ASCII data collected from the census forms

to Census Bureau headquarters for further processing. The MIS2000 and DMIS provided performance metrics, workflow reports, tracking and problem identification, and other information to aid management in making decisions regarding data capture and processing activities at HQ and within the DCCs.

Data Capture System 2000 (DCS2000)

The DCCs used the DCS2000 to complete the initial process of data capture. This system, which was developed, deployed, and maintained by Lockheed Martin, was used to image questionnaires and convert the responses to ASCII data by combining customized commercial off-the-shelf (COTS) software (see Table 6-3), Docutronix sorters, bar code scanners and printers, Kodak scanners, and Dell workstations operating on a Windows NT platform. Two secure T1 lines enabled this system to interface with two other census systems—HQ processing and MIS 2000.

Table 6-3.
DCS2000 Software

Name/Title	Application
Captiva Software	Form-processing and data-entry interface for rejection, repair, and key verification
Staffware	Workflow management software
FAQSS	OMR software
CGK	OCR software
Oracle	Database
Legato	Backup and storage software
Docutronix System Mail 2000 S/W VDD	Used for letter- and flat-sorter data controller
Kodak Adrenaline Runtime	Used to support advanced cleanup of images
Microsoft Windows NT	Used for data receipt and verification, external interface server, site workflow server, status database server, master message-oriented middleware, database server
NetHasp Server Key Authentication Software	
Tivoli Software Suite	Used to provide a unified, standard management approach to DCS2000 computing environments

Three subsystems—data receipt and verification (DRV), processing cluster, and system administration—performed the DCS2000's basic functions.

The DRV subsystem collected and sorted census forms from mailout/mailback and update/leave operations according to type and priority. Once collected, a form was checked in by reading the form bar code through the envelope window. Each form was printed with an interleaved 2 of 5 bar code with a 2-digit check digit that ensured the bar code would be read correctly. The check-in subsystem stored the unique identifier represented by the bar code in a check-in file that was transmitted daily to the HQ processing system's decennial master control to identify which addresses on the decennial master address file (DMAF) had returned questionnaires.

The DRV created a check-in file for both mail and nonmail returns to transfer to HQ for each of the following three check-in categories:

- **DCC box check-in from DCS2000 to HQ processing/Decennial Management Control (DMC):** One check-in file reflected daily activity related to boxes of enumerator forms received at a DCC from the local census offices (LCOs). Check-in files for boxes shipped from the LCOs contained a record for each box received at a DCC. Information pertaining to the shipment was reported to HQ and to the LCOs.
- **Exception check-in address information from DCS2000 to HQ processing/DMC:** Separate check-in files were created for census forms that were incomplete, lacked IDs, or were unreadable and therefore required manual sorting and check-in. These files consisted of records containing the census or processing ID and the geographic or address fields captured from each add or list/enumerate form at the exception check-in.

- **Mail return check-in from DCS2000 to HQ processing/DMC:** Check-in files were created for census forms returned by respondents to the DCCs through the United States Postal Service (USPS). These files were used to update the DMAF and thereby exclude those households from the list of nonrespondents.

After creating and updating the check-in file, clerks prepared the forms for imaging within a processing cluster.

Processing clusters were autonomous units of image processing constructed around the capacity of three scanners. Processing cluster operations included workflow management, form scanning, optical recognition, and manual keying. Each DCC had as many clusters as necessary to process its workload. Equipment was distributed to accommodate the DCC's workload (see Table 6-4). The Baltimore and Phoenix DCCs contained 15 clusters. The Pomona DCC contained 14 clusters, and the National Processing Center (NPC) DCC contained 10 clusters. Clerks input questionnaires that were completed and returned in envelopes via the USPS (including undeliverable as addressed returns at NPC) and questionnaires that were returned to the LCOs then sent to the DCCs via FedEx. Divided into four modules, the processing cluster included workflow management, imaging, optical recognition, and key from image (KFI).

Table 6-4.
Equipment by DCC Site and Cluster

Equipment	Baltimore, MD	Phoenix, AZ	Pomona, CA	NPC-DCC
Mail sorters	9 per site	7 per site	8 per site	6 per site
Manual/exception check-in workstations	12 per site	15 per site	13 per site	7 per site
Check-out workstations	81 per site	74 per site	79 per site	48 per site
Equipment	Units per cluster	Units per cluster	Units per cluster	Units per cluster
Doc prep supervisor work- stations	6	6	6	6
Scanners	3	3	3	3
Scanner controllers or key controllers	3	3	3	3
Automated image quality assessment (AIQA) servers . . .	4	4	4	4
Cluster workflow server	1	1	1	1
OCR servers	3	3	3	3
OMR servers	6	6	6	6
KFI workstations	21	21	21	21
Key from paper (KFP) work- stations	4	4	4	4
Audit resolution workstations . . .	6	6	6	6

The workflow management module managed and controlled the work performed by the imaging, optical recognition, and KFI modules. It also controlled sequences of cluster processing and balanced the cluster workload. The module also provided management metrics, supported assignment of work, and monitored quality by performing quality analysis and quality checks.

The imaging module captured digital images of census forms once they were received and processed by the DRV. This module created digital images from paper forms of various sizes ranging to a maximum of 11 inches wide by 25.5 inches long. Single-pass scanning of dual-sided, single-sheet forms at a rate of one short form per second produced a digital image of the paper form. Automated image quality assessment servers were then used to verify the quality of the image by checking the level of gray and white pixels in the image keys. Keyers worked within the imaging module to key in paper forms that optical character recognition (OCR) could not interpret. This module also controlled and stored images of paper forms once they were scanned and processed. An imaging subsystem created at least two copies of the full digital image, which were saved for backup purposes to two separate digital tapes.

The next step in the processing cluster was optical recognition. This module converted scanned images of census forms to ASCII text using bar code recognition, OCR, and OMR. Used by the optical recognition subsystem, bar code recognition distinguished between multiple bar code identifiers located on the images. This provided the automated capability for image indexing using the bar codes to identify each form entered into the system.

OMR software captured the data on questions that respondents answered by marking checkboxes. This software determined whether or not a box was checked, without regard to the possibility of multiple boxes within a question being checked. OMR was not able to distinguish responses where only a single entry was requested and appropriate. (Multiple responses were usually the result of respondent confusion or lack of compliance with the questionnaire wording.) Critical fields with multiple responses were sent to KFI for verification. When respondents checked multiple boxes, OMR passed the answers on to optical answer recognition where additional software applied algorithms to determine the single correct box, or answer, to the question. The OAR possessed the capability to logically determine the correct answer to a multiple-choice question based upon respondent-provided information on the form.⁵⁰

The OCR component of the optical recognition module interpreted write-in entries by respondents and provided the output in ASCII format.⁵¹ OCR matched its interpretation of write-in responses to information from data dictionaries provided by the Census Bureau. Updated on a continuing basis, these data dictionaries were designed to maximize OCR “hit rates” by providing the system with common responses against which it could compare its interpretation (see Table 6-5).⁵²

Table 6-5.
Data Dictionaries Supporting the OCR Subsystem

American Indian tribes	Female first names	Occupation
Ancestry	Foreign country names	Place names
Asian and Pacific Islanders	Hispanic origin	Relationship
County names	Kind of industry	State names
Duties	Languages	Surnames
Employer name	Male first names	

Source: U.S. Census Bureau, “Program Master Plan: Data Capture Systems and Operations,” Census 2000 Informational Memorandum No. 107, March 30, 2001, p. 26.

The KFI module supported the optical recognition module and was the final component of the processing cluster. Forms containing characters or marks that were assigned a low confidence level and flagged by the recognition software required additional processing. The KFI module employed keyers using workstations to manually edit all fields containing flagged characters or marks. Through recognition repair, operators keyed numeric census IDs for those bar codes that were either not recognized or rejected by the software. This subsystem also used a quality assurance (QA) process called “recognition verification” in which clerks rekeyed selected forms to verify the results of the OCR/OMR processes. An audit resolution subsystem provided an automated form-editing capability to identify and route to keying workstations forms that contained erroneous data on persons living in the housing unit.⁵³

The third subsystem of the DCS2000, system administration, administered and controlled the operations of all DCCs and delivered final output to HQ. This subsystem controlled the sequences of site-level processes and reconfigured and balanced site workload. It also monitored resource performance and support diagnostics, supported backup and recovery, provided security management and management metrics, and served as the interface through which data were forwarded to HQ processing.

⁵⁰ U.S. Census Bureau, “Program Master Plan: Data Capture Systems and Operations,” Census 2000 Informational Memorandum No. 107, March 30, 2001, p. 25.

⁵¹ All alphanumeric fields were sent to keying.

⁵² For more detailed description of the OCR and OMR processes and the DCS2000, see the “Data Capture Outsourcing” section of this chapter.

⁵³ U.S. Census Bureau, “Program Master Plan: Data Capture Systems and Operations,” Census 2000 Informational Memorandum No. 107, March 30, 2001, p. 27.

Headquarters Processing

The HQ processing system controlled, managed, and processed Census 2000 data. HQ processing was not a single system, but rather a coordinating mechanism for several unique census applications used to perform various data processing and controlling operations on data collected by Census 2000 systems and by the Accuracy and Coverage Evaluation (A.C.E.) survey. Census Bureau technical staff developed each of the HQ processing applications using programming languages such as FORTRAN, Pascal, Borland Delphi, C, and C++. HQ processing applications were mainframe-based at the Bowie Computing Center (BCC) in Bowie, MD, and the National Processing Center (NPC) in Jeffersonville, IN. A wide area network using a T1 frame relay network connected HQ processing components at HQ and NPC to each other and to regional census centers and LCOs. This network of applications, systems, and processes interfaced with eight major census systems and was grouped into three operational categories: address list capture operations (ALCO), decennial management control (DMC), and postresponse processing system.⁵⁴

ALCO included the following series of operations performed at the NPC, many of which were to refine, update, and edit the address listing for rural and suburban areas prior to conducting the census:

- **Address listing data capture:** This involved keying in data from the bound address listing pages received from operations conducted in the field to identify addresses and locations. Specific activities included check-in, document preparation, keying, quality assurance, and reporting.
- **Address listing map-spot digitizing:** Each address register book included block maps used by data collection personnel in census field offices to place map-spot indicators for each housing unit. Once NPC checked in an address register, its maps were scanned, and each map-spot was digitized from the resulting image. NPC personnel then added or modified features in the Topologically Integrated Geographic Encoding and Referencing (TIGER®) system according to the annotations on the census address list block maps. They also resolved map-spot mismatches between the Master Address File Update File and TIGER®. The digitized versions of these maps were converted to ASCII data and sent to the Census Bureau's Geography Division for processing.
- **Block canvassing data capture:** Block canvassing validated city-style address areas and added new addresses to the master address file (MAF). Census workers updated a listing of known addresses with additions, deletions, and corrections for a census block. The listing was sent to NPC for capture of the address changes.
- **Address list review (ALR) data capture:** This partnership program gave local and tribal governments the opportunity to review and update the MAF. The data capture operation was conducted at each stage of the ALR program: submissions by local and tribal governments of new addresses, submission of the new addresses to the field for verification or recanvass, adjudication of address differences, and final submission of addresses reflecting the results of any appeals.
- **Update/leave (U/L) address book data capture:** Census workers used U/L address registers to hand-deliver census forms, and they updated the registers with additions, deletions, and corrections as needed. These address registers were sent to the NPC, where address changes were made using keying from the paper (KFP).
- **List/enumerate (L/E) address listing data capture:** Census workers used blank L/E address books to record addresses, then map-spotted housing units, and finally captured the data on census questionnaires. The NPC used KFP to capture addresses from the L/E address listing operation. These listing books were labeled with control bar codes. Data from the questionnaires were also captured by NPC using KFP.

⁵⁴ U.S. Census Bureau, "System Architecture," Version 2.0, September 2000, pp. 10-1–10-14.

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- **Update/enumerate (U/E) address list data capture:** Census workers used U/E address books to record additions, deletions, and corrections for a block. The listing books were labeled with control bar codes. Data were captured on census questionnaires. The listing books and questionnaires were sent to DCCs for capture using KFP or scanning.
 - **Quality Improvement Program (QIP) address listing data capture:** The QIP operation involved conducting an independent listing of housing units for comparison with the MAF to determine the quality of the census address base.
 - **Island Areas address listing data capture:** Addresses from the Island Areas address listing operation were captured by NPC using KFP. The listing books were labeled using control bar codes. Data from the Island Areas questionnaires were also captured by NPC using KFP.
 - **A.C.E. address listing data capture:** Addresses from the A.C.E. independent listing operation were captured by NPC.
 - **A.C.E. map scanning:** Census workers digitally scanned A.C.E. address listing maps to provide electronic copies. The electronic images were used to assist those performing the A.C.E. address matching operation.
 - **Group quarters (GQ) capture:** Completed GQ questionnaires were sent to the NPC for data capture. Forms used in the most populous types of GQs—those forms expected to have more than a million responses—were captured in the DCS2000 environment. The remaining GQ forms were captured by a keying operation outside the DCS2000 environment. HQ processing was responsible for capturing these low-volume forms in a KFP operation.

The second operational category of the HQ processing system was decennial management control (DMC). DMC was a complex network of operations controls that collected and processed data associated with Census 2000 activities. DMC enabled interactions with the MAF, Operations Control System (OCS) 2000, and DCCs; the Telephone Questionnaire Assistance (TQA), Internet Questionnaire Assistance (IQA), and coverage edit follow-up programs; and the responsible divisions. DMC controlled the following operations:

- **Decennial master address file (DMAF) creation:** The DMAF was a series of files that constituted the foundation for the operation used to control and track census operations. The MAF was the base file used to create the DMAF. The DMAF files were partitioned by state and indexed by region. The geographic reference file and the MAF were inputs to the DMAF that were provided to partition the DMAF and facilitate a faster interface for collection and processing operations during the census data collection and postprocessing operations.
- **DMAF updates:** MAF refresh files, as well as OCS 2000, TQA, IQA, and DCS2000 status updates were used to update the DMAF at specific points in the processing.
- **Form type sampling:** The census collected some data on everyone, called “100 percent” data, and collected some data only from a sample of people. The short-form census questionnaire asked only those questions that collected the 100 percent data, while the long-form questionnaire asked questions that collected both the 100 percent and the sample data. Addresses considered to be valid prior to the beginning of census data collection were chosen to receive sample forms (the long form) based on the population size of the governmental unit where they were located. The selected addresses were identified on the DMAF as units to receive long forms.
- **Creation of address file tapes:** A private contractor printed, addressed, and mailed census forms. Before this could be done, however, it was necessary to extract, organize, and deliver to the contractor files of addresses from the DMAF. Included in these files was the information necessary to place bar codes on the forms. These bar codes indicated the geographic area, census identification, form type, and other information required to control and prioritize data capture in the DCCs and control data collection activities.
- **Mail return surname determination:** In certain areas, identification of housing units on the ground was difficult and presented a considerable challenge, particularly during nonresponse follow-up (NRFU). These included rural areas that rely heavily on rural route/box number

addresses and multiunit structures in more urban areas. USPS misdeliveries of census questionnaires could occur at these types of addresses. During the follow-up operation, the Census Bureau provided enumerators with the name of the first person enumerated on the questionnaires that respondents from units with rural addresses and in multiunit structures returned by mail. The surname identification operation flagged the addresses and the MAF IDs of units that required surname capture. This information was included in the NRFU assignment address registers to help enumerators determine which units had already been enumerated by mail and which ones needed to be enumerated in NRFU.

- **Data Capture System (DCS2000)/Data Capture Services Contract (DCSC):** Captured files, control information, and QA and workflow status information for the four DCCs were transmitted to HQ. The interface used for this purpose defined the requirements for and method of transferring the files and the interactions necessary to acknowledge their receipt.
- **Check-in of undeliverable as addressed (UAA) returns:** The check-in of UAA returns included the capture of the census ID for each such questionnaire package. Check-in information was then used to update the DMAF with the status of the address.
- **Receipt of check-in files for mailback and enumerator returns:** These check-in operations included using laser sorters to capture the IDs of questionnaires returned by respondents and those completed by enumeration. Mail responses came from questionnaire mailouts, Be Counted forms (BCFs), TQA responses, and the Internet. The check-in data were used to update the DMAF for use in defining the responding universe.
- **Receipt of data capture files for mailback and enumerator returns:** HQ received these data capture files, which included response codes created from mail returns and enumerator short- and long-form questionnaires as well as those of BCFs or TQA and IQA responses. These records were loaded into the decennial response file.
- **Decennial response file (DRF) processing:** The DRF contained all responses to the census. The DRF processed data records from DCS2000, the Internet, TQA, NPC, and GQ keying, and it stored results from the mail response data capture, BCFs, enumerator forms, and GQ forms. DRF processing was a two-stage operation. The first stage (DRF1) involved handling the raw responses from data capture and lasted through the end of data capture. Once all of the data records that had been assigned a MAF ID were accepted, the second stage (DRF2) began. The second stage linked together the information from various responses and restructured all the data in preparation for multiple-response processing.
- **Assignment of address identifiers:** Responses to the census that lacked address identifiers were sent to GEO for matching and assignment. These responses included telephone responses, BCFs, and additions from the U/L and NRFU operations. In GEO, a match operation checked to see if the address was already on the MAF. If not, a provisional MAF ID was assigned, which became permanent after the address was verified in the field. Verified addresses were also placed on the DMAF, allowing the response record to be added to the DRF1.
- **Nonresponse follow-up identification:** This operation identified all nonresponding addresses based on the mail return, TQA, and Internet check-in flags encountered in the DMAF. The addresses and surnames for this nonresponding universe were provided to the LCOs through OCS2000 for use in NRFU operations.
- **Late mail return:** After the NRFU universe was identified, but before the NRFU operation began, HQ processing provided LCOs with a list of responses received after the cut-off date for identifying nonresponding HUs. These were to be removed from the NRFU universe.
- **Coverage improvement follow-up (CIFU) operation:** CIFU was a procedure in which HUs with conflicting status information were followed up. HQ processing provided information to OCS2000 of housing units that had been checked in to a DCC, but for which data were not captured. This information was used in CIFU operations.

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- **Coverage edit follow-up (CEFU) operation:** CEFU was done to resolve forms that were incomplete or had coverage discrepancies. If a mail return or BCF response failed selected coverage edits, the respondent was contacted by phone for follow-up. Information received during CEFU was keyed into a data collection system that used computer-assisted telephone interviewing. The information was then sent back to the DRF.
 - **Decennial field interface (DFI):** DFI provided the framework for data collection control activities at the field offices. The DMC infrastructure provided OCS2000 with files used to control data collection operations.⁵⁵
 - **Address verification:** Responses from BCF and TQA generated possible new addresses for the MAF and DMAF and required address verification in the field. OCS2000 passed the assignments and results to and from the field offices and the DMAF.
 - **Receipt of check-in files for TQA responses:** TQA responses received by the postresponse processing system that did not have census MAF IDs were processed through the MAF/DMAF identification system before posting to the DMAF and DRF.

The postresponse processing system comprised a series of post-data-capture operations, including those required to resolve problems of multiple responses, correct status and count inconsistencies, code write-in responses, edit data, impute missing data, recode for tabulation, apply disclosure avoidance processes, and prepare the input files needed by the data access and dissemination system (DADS). Major postresponse processing operations included:

- **Multiple-response processing:** The multiple-response processing operation identified and flagged for removal person records and housing unit records that were redundant. The primary selection algorithm (PSA) processed data records in the DRF of housing units whose response records represented more than one enumeration of the unit. The algorithm identified the unique person records to be included in the census for each of these units and excluded records for persons enumerated more than once.
- **Census unedited file (CUF) creation:** Information from the DMAF control file and the PSA results were used to create the 100 percent census unedited file (HCUF). This file included housing units that were confirmed to exist and the occupants of those units (including people added through count imputation), as well as the people enumerated in GQs.
- **Edit and imputation for 100 percent data:** The census edited file (CEF) was created by applying a series of content edits to the 100 percent responses on the HCUF. CEF was imputed from donor records for missing and inconsistent responses.
- **Dual system estimation (DSE):** Matching results from the A.C.E. were returned to HQ from NPC on a flow basis. At HQ these data were prepared for estimation processing, and coverage estimates were produced for the Decennial Statistical Studies Division.
- **Create apportionment counts:** Final unadjusted person counts by state were tabulated and provided to the Census Bureau's Population Division for use in computing the assignment of congressional seats to the states. This process combined the count of persons in the response data with the count of persons provided by federal agencies for military and federal government employees overseas. The counts were accumulated and merged into totals for each state, the District of Columbia, and Puerto Rico. The counts were processed according to the apportionment algorithm to produce the number of representatives for each state.
- **Disclosure avoidance processing:** Disclosure avoidance techniques were applied to ensure the privacy and confidentiality of respondents.
- **Sample-data weight processing:** Weighted counts for the sample data were defined and produced.

⁵⁵ For more information on the DFI, see Chapter 5, "Data Collection."

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- **Edit and imputation for sample data:** The sample census edited file was created by applying a series of content edits to the sample data using donor records to impute missing and inconsistent data. The results of this process on sample records were appended to the file that contained all sample results.
 - **Computation of variance:** This operation included the calculation of confidence intervals that represented the statistical confidence bounds of the census sample data.
 - **Tabulation recoding:** Tabulation recodes were calculated to produce the variables required for specific tabulations. The tabulations were produced by HQ processing and the DADS.⁵⁶

Another component of the HQ processing system was automated coding. This process assigned specific codes to the write-in responses captured from the census forms. The data were matched against the dictionary and assigned a census code. The general coding operation assigned codes for responses on three write-in lines (Asian and Pacific Islander, American Indian, and “some other race”) and responses covering information about persons in the household (i.e., Hispanic origin, language, ancestry, and relationship). The geographic coding operation assigned codes for place of birth, place of work, and migration. Place-of-work and place-of-birth data were sent to GEO where they were matched against the appropriate dictionaries and then matched against the TIGER® database. Coding issues not resolved by GEO were sent to the NPC, and there data were matched against coding dictionaries and the TIGER® database for clerical review and final coding. The industry-and-occupation coding operation assigned codes to the industry-and-occupation responses to selected questions on the long-form questionnaire. These data were sent to the NPC, where they were matched against dictionaries for clerical review and coding resolution. Finally, all special place and group quarters (SP/GQ) information to be included in the DRF and DMAF was collected by combining inputs from an SP/GQ data system and the DCS2000 located at the NPC.

Management Information System (MIS2000)

In addition to transmitting census data, the DCS2000 provided HQ with performance metrics that were transmitted to the MIS2000. The MIS2000 was the official source of management information for Census 2000. The system provided data about the progress of the census using a database that collected information on scheduling, progress to date, and performance anomalies. The system also supported cost-modeling and other decision-support software. This information assisted managers in assessing and modifying operational plans, monitoring and managing operations and costs, and identifying problems.⁵⁷

DCSC Management Information System

Within each DCC, however, the DMIS provided management information and support. Developed, tested, and operated by the DCSC contractor, DMIS facilitated and supported the management of the four DCCs and the Operational Control Center. At the three contractor-operated DCCs, DMIS applications supported the following functions:⁵⁸

- Office automation
- Qualified applicant tracking system
- Security
- Time and attendance
- Payroll
- Problem referral system
- Tracking of risks, issues, deliverables, and action items

⁵⁶ For more information on DADS, see Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

⁵⁷ U.S. Census Bureau, “System Architecture,” Version 2.0, September 2000, pp. 9-1–9-12.

⁵⁸ At the NPC-DCC, DMIS provided the same functions with the exception of payroll, cost accounting and reporting, and time and attendance.

- Scheduling
- Operations management reports
- Cost accounting and reporting
- DCSC inventory control

Local vendors performed hardware maintenance for DMIS, and TRW's program management office managed maintenance applications for the system.

ORGANIZATION AND LOGISTICS

In 1990, the Census Bureau's use of automation in the field required the agency to recruit and test over 42,000 applicants and train approximately 10,000 temporary employees to staff seven processing offices. For Census 2000, the Census Bureau decided that the most cost-effective and efficient strategy was to outsource data capture and operate four data capture centers (DCCs). The DCCs required a combined staff of 8,735 full-time employees, including 2,970 staff for key-from-image inputting and 419 staff for key-from-paper inputting.⁵⁹ The Census Bureau awarded the data capture services contract (DCSC) to TRW Inc., which developed and implemented the day-to-day procedures for the DCCs. TRW provided the staff and facilities to house and operate the DCS2000 equipment at three sites (Baltimore, MD; Phoenix, AZ; and Pomona, CA).⁶⁰ For each of these locations, TRW worked with subcontractors who managed operations at the DCCs. These included Computer Sciences Corporation in Baltimore, NCS in Phoenix, and DynCorp in Pomona. The National Processing Center (NPC), the Census Bureau's permanent facility in Jeffersonville, IN, served as the fourth data capture center site (NPC-DCC). To ensure consistency across DCCs, TRW supported select activities in the NPC-DCC, such as design and build-out, training, and basic procedures. Using procedures developed by TRW, NPC personnel developed and wrote processing operations specific to their DCC that included data capture of foreign-language questionnaires, Be Counted forms, and check-in of undeliverable as addressed (UAA) packages. The Census Bureau utilized NPC's existing infrastructure and was responsible for the management, recruiting, and staffing of the NPC-DCC.

In addition to a substantial number of workers, each DCC required between 200,000 and 272,500 square feet of space.⁶¹ During peak operations—two shifts a day, 6 days a week—DCCs required staff as outlined in Table 6-6.

Table 6-6.
DCC Staff Requirements

Staff	Baltimore	Phoenix	Pomona	NPC
DCC site managers	2	2	2	1
Census Bureau representatives ⁶²	3	3	3	N/A
Other DCC managers and support staff ⁶³	82	77	108	30
Clerical labor	948	824	997	900

In addition to the capture of questionnaire data, each DCC was responsible for the following:

- *Facilities management:* Providing physical security, concession services, janitorial services, grounds maintenance, repairs, and utilities.

⁵⁹ U.S. Census Bureau, "Assessment Report: Data Capture of Paper Questionnaires, Final," Census 2000 Informational Memorandum No. 135, February 19, 2003, p. 6.

⁶⁰ The Baltimore DCC site was physically located in Essex, MD, which is in Baltimore County, outside the city of Baltimore.

⁶¹ The NPC-DCC was approximately 150,000 to 170,000 square feet.

⁶² Included one senior site representative and two assistant site representatives.

⁶³ Included business staff, quality assurance (QA) management and staff, network administrators, facilities management staff, human resources management and recruiting staff, training management and staff, operational managers, TRW site representatives, and U.S. Postal Service/Federal Express liaisons.

- *Document management*: Providing paper and/or electronic document management for all manuals, directories, regulations, procedural documents, and training materials.
- *Inventory management*: Producing and submitting monthly control reports to the Census Bureau.
- *Human resources*: Providing their own advertising, recruiting, hiring, and placing of staff.
- *Training*: Training and training materials for all operations and positions.⁶⁴
- *Forms disposal*: Maintaining census forms in storage after scanning until all subsequent data capture operations for the forms were completed and data transmission to headquarters was confirmed.
- *Translation/transcription*: Translating and transcribing Asian-language versions of Census 2000 forms. (These services were available at the NPC-DCC only.)

Management Structure

The Census Bureau provided TRW and its subcontractors with on-site representatives who reported to the Operations Control Center (OCC) located in the Decennial Contracts Program Office in Lanham, MD.⁶⁵ Census Bureau representatives monitored daily operations and provided advice and technical support to contractor-managers about unforeseen matters regarding the handling of forms or Title 13 data.

TRW and its subcontractors provided the management and support staff at the Baltimore, Phoenix, and Pomona DCCs. At the head of the DCC management was the site manager. The site manager, who reported directly to the DCSC program manager, was responsible for directing, monitoring, and coordinating all work activities in the DCC, managing all employees and subcontractors, and providing the central client interface at the DCC level. The deputy site manager directed, organized, monitored, and coordinated all data capture operations at the DCC, and in the absence of the DCC site manager, the deputy assumed on-site management responsibility. The deputy site manager also directed the work of the staff scheduler and the U.S. Postal Service (USPS)/Federal Express (FedEx) liaison,⁶⁶ as well as managed the operations managers.

Each operations manager was responsible for one shift, directing the active processes and cooperating with other functional managers, as necessary, to ensure smooth work flow. DCCs employed three operations managers. Reporting to the operations managers were departmental managers. There were eight DCC departmental managers per shift; these managers directed all operations within the processing departments, including mail operations, warehouse operations, check-in, document preparation, imaging, key from image (two managers per shift), key from paper, and check-out. Each department had a first- and second-shift manager, and a third if needed.

DCCs also employed a number of specialized managers. The human resource manager coordinated the functions of employment, compensation, benefits, communications, employee relations, safety, health, and related areas. Human resource managers oversaw the work of two human resources representatives, eight recruiting specialists, three recruiting assistants, and two administrative assistants. The training manager, who also served as a training developer during the planning phase, directed the work of three lead trainers and five local training specialists. DCCs also employed a quality assurance manager who directed a staff of two analysts to ensure customer satisfaction and quality improvement in the processes and in the outcomes.

The DCC facility manager had responsibility for the entire DCC facility, including utility services, communications, shipping, receiving, and security. This manager was also responsible for the timely removal of paper waste and the proper and secure disposal of forms. A facility supervisor reported directly to the facility manager. This supervisor directed no less than eight personnel, including two help desk administrators, two security supervisors, two maintenance supervisors, and supervisors of subcontractor services.

⁶⁴ A subcontractor, Troy Systems, was responsible for the DCSC training program for all four DCCs.

⁶⁵ DCC was assigned three representatives on temporary duty from the Decennial Contracts Program Office.

⁶⁶ Federal Express is an overnight shipping company that was contracted to deliver completed questionnaires from the local census offices to the DCCs.

Finally, the business manager was responsible for program administration. This manager developed plans and budgets, monitored costs, provided statistical reports, prepared contract deliverables, and negotiated and managed subcontracts. The business team was made up of a business manager, management analyst, program controller (financial management), contracts and purchasing specialist, and two communications specialists. This team was responsible for maintaining the local area network, conducting file backups, restoring files as required, and operating the DCSC Management Information System.⁶⁷

NPC-DCC Management Structure

Management at the NPC-DCC differed slightly from that of the three contractor-operated DCCs. During a reorganization in 1999, the Census Bureau established the NPC-DCC with an assistant division chief for decennial data capture responsible for directing, monitoring, and coordinating all work activities at the NPC-DCC. The Census Bureau established two branches for the NPC-DCC, one for operations and one for administration. The chief of the Data Capture Operations Branch was responsible for questionnaire processing (i.e., mail prep, sorter check-in, manual/exception check-in, and document preparation), imaging operations (i.e., scanning and document analysis), key from image (KFI)/audit resolution (AR), and key from paper (KFP)/check-out operations. The chief of the Administrative Operations Branch was responsible for administrative support (e.g., staffing and scheduling), procedures and training, and workflow support (e.g., reports generation and questionnaire flow). In addition to these chiefs, the NPC-DCC employed a network administrator to provide assistance to managers.

DCC Support Staff

DCCs employed personnel to provide support to the management staff. These positions included a staff scheduler, a USPS/FedEx liaison, a community relations liaison, and a DCC management administrative assistant. The staff scheduler was responsible for the daily staffing of the workforce based upon projected needs and absenteeism patterns. The USPS/FedEx liaison established relationships with the local USPS and FedEx offices to ensure that schedules were instituted and met. The community relations liaison monitored relations with state and local governments, local Census Bureau offices, and the media. The DCC management administrative assistant provided day-to-day operational assistance to DCC managers.

Other on-site positions were created to complement, monitor, and facilitate the work of the DCC staff and management. TRW also provided on-site representatives who were responsible for ensuring that policies and procedures developed during the planning and preparation phases were consistently followed. Lockheed Martin Mission Systems provided on-site representatives, including managers and technicians who were responsible for maintaining and supporting the DCS2000. Lastly, DCC liaisons in the field served as the point of contact between the DCC and the local census office/regional census center (RCC), primarily monitoring FedEx shipments of enumerator questionnaires. These liaisons provided weekly summary reports regarding shipping progress to each RCC, headquarters management, and the DCC Census Bureau representatives.

DATA CAPTURE

During Census 2000, the DCCs captured data from 151.3 million paper questionnaires in a two-pass data capture process. Beginning on March 6 and concluding on September 15, 2000, the first pass captured all 100 percent data and all data from forms input by the key-from-paper (KFP) process. Pass 2, which began on August 28 and concluded on November 15, captured sample data from the images of each long form captured during Pass 1. DCC staff used the key-from-image (KFI) procedure to capture sample write-ins rejected by optical character recognition (OCR), and between August 28 and November 15 transmitted the Title 13 data to headquarters data processing. Table 6-7 illustrates the DCC's workload for Pass 1 and Pass 2.

⁶⁷ U.S. Census Bureau, "Program Master Plan: Data Capture Systems and Operations," Census 2000 Informational Memorandum No. 107, March 30, 2001, pp. 4–8.

Table 6-7.
Processing and Title 13 Transfer Data Capture Workload
 [In millions]

DCC	Pass 1	Pass 2
Baltimore	38.4 questionnaires	6.7 long forms
Phoenix	45.9 questionnaires	7.2 long forms
Pomona	43.9 questionnaires	7.3 long forms
NPC-DCC	23.1 questionnaires	2.7 long forms

Source: U.S. Census Bureau, "Assessment Report: Data Capture of Paper Questionnaires, Final," Census 2000 Informational Memorandum No. 135, February 19, 2003, pp. 9–10.

The data capture process began with mail-receipt and document preparation functions. Within 48 hours of receipt, DCC staff checked in forms mailed back by respondents. At mail-receipt stations, clerks unloaded census forms from delivery vehicles and prepared them for check-in, which consisted of capturing the bar code data on each form using laser sorters and transmitting that data to the Decennial Systems and Contracts Management Office (DSCMO). The check-in file was used to identify which addresses on the decennial master address file (DMAF) had returned their forms.

After check-in, forms proceeded to document preparation, where they were removed from their envelopes and prepared for scanning. The scanning process produced electronic images of the paper forms to be interpreted by optical mark recognition (OMR) and OCR. Fields eligible for imaging that could not be interpreted with a certain level of confidence were sent to KFI and manually keyed. Forms that could not be successfully imaged were sent to KFP, where clerks manually keyed the entire form.

Additionally, KFI included analysis and review of critical check-box questions. Forms then proceeded through an automated audit resolution (AR) process for identification and editing of erroneous population counts. Once through AR, these data were merged with other data and transmitted to headquarters (HQ). After HQ acknowledged receipt of the data, DCC staff performed a checkout function to ensure that DSCMO received acceptable output for every form sent through data capture.

Check-In and Document Preparation

During the mail-receipt operation, staff unloaded census forms from delivery vehicles, sorted forms by type into bins, and transported each to appropriate check-in stations. The check-in operation identified nonresponding addresses in order to determine the nonresponse follow-up (NRFU) universe. To accommodate other operational requirements, certain returns required priority processing. Priority forms included:

- **Be Counted forms:** (at the National Processing Center-data capture center [NPC-DCC] only)
 These forms received high priority because of the amount of subsequent processing required. Captured address information from the forms was sent to Geography Division (GEO). GEO matched and geocoded the addresses and assigned each a census ID for inclusion in the decennial master address file (DMAF).
- **Surname data capture:** As early as possible in the data capture process, DCC clerks captured the names of householders in multiunit dwellings, such as apartment buildings, and at rural style addresses. This enabled DSCMO to include them on the NRFU universe determination file.
- **Non-ID:** DCC clerks captured address information from returns without a bar-coded census ID, and GEO matched, geocoded, and assigned each a census ID for inclusion in the DMAF.

The check-in process also updated the status database with the DCS2000 check-in information. This established the tracking system used to monitor the progress of forms through the data capture process. The check-in operation began on March 6 and concluded on September 14, 2000. During that time, the operation processed over 161.6 million census forms, of which 9.3 million were returned to the DCC as being undeliverable as addressed (UAAs).

Census returns were sorted and checked in at three different stations. Short-form mail returns and short-form UAAs were directed to automated letter sorters, which sorted returns at an approximate rate of 16,100 envelopes per hour. Automated flat sorters, sorting at a rate of approximately 10,500 envelopes per hour, were used for long-form mail returns, long-form UAAs, and Be Counted forms. Enumerator returns, group quarter (GQ) forms, and other mail were sent to manual check-in.

Automated sorters separated forms by type and priority into specific output pockets. DCC staff selected sort plans that corresponded with the form types to be processed at the beginning of each shift.⁶⁸ Sort plans separated high priority forms such as BCFs and foreign-language forms from other forms to facilitate NRFU enumeration efforts. (NRFU interviewers used the surnames to help resolve apartment mix-ups and as an aid in locating nonresponding units.) Automated sorters read the unique bar codes through the envelope windows and sorted the envelopes into predetermined pockets. Sweeper clerks gathered the envelopes into trays, tagged the trays, and transported them to document preparation. Forms whose IDs were not read by the mail sorters on the initial pass were directed through the sorter for two additional passes. If the IDs could not be read, the forms were sent to manual check-in.

During manual check-in, clerks performed a procedure in which the census IDs of envelopes received in boxes from local census offices (LCOs) were scanned and the envelope contents verified. Forms sent to manual check-in included those from the list/enumerate (L/E) procedure (including Remote Alaska) and additions from update/enumerate, NRFU, and coverage improvement follow-up (CIFU), all of which arrived without bar code IDs. At workstations, clerks captured the addresses from these forms and assigned each a 14-digit processing ID bar code that was placed on the bottom right corner. Mail returns not successfully checked in by automated sorters were sent to check-in clerks who removed the forms from envelopes, organized them in trays according to form type, and sent them on to be scanned. Check-in clerks scanned or manually keyed the bar code from the forms and sorted them into new trays according to type and priority (BCFs were sorted by language). After each form was assigned a processing ID and its address data keyed, it was placed in a box and sent to document preparation.⁶⁹

Several form types identified during manual check-in were processed only at designated DCCs. These forms, including but not limited to Asian-language forms, GQ forms, experimental forms, and Puerto Rico forms, were identified as exceptions during check-in and forwarded to document preparation exception processing, where they were shipped to the correct DCC for processing. Table 6-8 illustrates the distribution of form types and their data capture locations.

Clerks removed envelopes, staples, and other materials during document preparation, and prepared forms for scanning by unfolding, flattening, and placing them in trays in batches of 500 sheets per tray. DCC procedures recommended, but did not require, a 48-hour acclimation period prior to scanning to allow the paper to flatten and normalize to the environmental conditions of the imaging area in order to reduce the frequency of scanner jams.

⁶⁸ Sort plans instructed the sorter on how to separate forms by type, priority, and the number and order of output pockets where the forms were to be delivered. At the contracted DCCs, sort plans remained constant for the short- and long-form mail returns. At the NPC-DCC, there were separate sort plans for different mail returns, UAA returns, and BCFs. A color-coded quality assurance (QA) test-deck was used to confirm proper functioning of the sorters at the beginning of each shift or whenever a sort plan changed.

⁶⁹ Address data for unassociated continuation forms were keyed and sent to GEO for geocoding.

Table 6-8.

Questionnaire Check-In and Data Capture by Method of Data Collection

Data collection method	Type of questionnaire	Check-in method	DCC where data capture took place
Mailout/mailback	Short and long forms	Sorter	All DCCs
Update/leave (stateside)	Short and long forms	Sorter	All DCCs
	Short and long forms—addresses added by enumerator	Manual check-in and address capture	Phoenix
Update/leave (Puerto Rico [PR])	PR short and long forms (Spanish)	Sorter	Pomona
	PR short and long forms (Spanish)—addresses added by enumerator	Manual check-in and address capture	Pomona
Update/enumerate	Short and long forms	Scanner	All DCCs
	Short and long forms—addresses added by enumerator	Manual check-in and address capture	All DCCs
Telephone questionnaire assistance (TQA) replacement (with housing unit ID)	Short and long forms	Sorter	Baltimore
	PR short and long forms (Spanish)	Sorter	Pomona
TQA replacement (without housing unit ID)	Short and long forms	Sorter—rejected and sent to manual check-in and address capture	Baltimore
	PR short and long forms (Spanish)	Manual check-in and address capture	Pomona
Spanish and foreign-language mailout (stateside)	Short and long forms (Spanish + 4 Asian languages)	Sorter	NPC—4 Asian languages Phoenix—Spanish
Translated or transcribed Asian-language forms	Corresponding English-language forms	Manual check-in	NPC
List/enumerate (stateside only)	Short and long forms	Manual check-in and address capture	All DCCs, except NPC
	Short and long continuation forms	Manual check-in and address capture	All DCCs, except NPC
Nonresponse follow-up and coverage improvement follow-up (stateside)	Enumerator Questionnaires (EQs)		
	Short and long forms	Scanner	All DCCs
	Short and long forms—addresses added by enumerator	Manual check-in and address capture	All DCCs
	Short and long continuation forms	Manual check-in	All DCCs

Table 6-8.

Questionnaire Check-In and Data Capture by Method of Data Collection—Con.

Data collection method	Type of questionnaire	Check-in method	DCC where data capture took place
Nonresponse follow-up and coverage improvement follow-up (PR)	EQs		
	PR short and long forms (Spanish) PR short and long forms (English)	Scanner	Pomona
	PR short and long forms (Spanish)—addresses added by enumerator PR short and long forms (English)—addresses added by enumerator	Manual check-in and address capture	Pomona
	Short and long continuation forms (Spanish) Short and long continuation forms (English)	Manual check-in	Pomona
Outlying areas of Alaska	Short and long forms	Manual check-in and address capture	Pomona
Be Counted forms (stateside)	English, Spanish, and 4 Asian-language forms	Sorter used for check-in counts by form type only. ID and address data captured during scanning	NPC
Translated or transcribed Asian-language forms	Corresponding English-language forms	Scanner	NPC
Be Counted forms (PR)	Spanish- and English-language forms	Sorter used for check-in counts by form type only; ID and address data captured during scanning	NPC
Undeliverable as addressed	Short and long forms	Sorter	NPC
Group quarters (stateside)	Individual Census Report (ICR) short and long forms ICR short and long forms (Spanish) Military Census Report (MCR)	Manual check-in of GQ cover sheets (D-352s); questionnaire IDs captured at scanning	NPC
	Shipboard Census Report (SCR) Individual Census Questionnaire (ICQ) short and long forms	Manual check-in of GQ cover sheets (D-352s) in the DCC	Data captured (keyed) at the NPC outside the NPC-DCC environment due to low form volume
Group quarters (PR)	ICR short and long forms (Spanish) ICR short and long forms (English) MCR (English) SCR (English) ICQ short and long forms (Spanish) ICQ short and long forms (English)	Manual check-in of GQ cover sheets (D-352s) in the NPC-DCC	Data captured (keyed) at the NPC outside the NPC-DCC environment

Imaging

The imaging process began with scanning. Clerks fed trays of census forms into a high-speed scanner. Software in the scanner prepared an image for processing by first registering it into the system. Registration of the image defined all OCR and OMR zone areas used to recognize information contained on the form. During the scanning process, clerks encountered a variety of problems, including scanner jams, multiple feeds, torn or unscannable forms, and duplicate batches. Scanner operators resolved these problems by stopping the machinery once the problem was

identified. Operators would then rework the batch or redirect the “problem” forms to document preparation exceptions processing for repair or to KFP.

Operators monitored image quality during the scanning process through a combination of manual review and automated document analysis. As the batches were scanned, operators reviewed the digital images on control monitors to identify flaws or deterioration in image quality. Operators could stop the process to identify and correct problems and then reprocess batches where problems were discovered. In addition to manual review, the scanning operation utilized automated image-quality assurance (AIQA) software to monitor image quality. The AIQA application performed form identification; image skew detection; and correction, cropping, and image rotation. This application also detected poor-quality images and corrected them where possible. Document analysts reviewed images that failed AIQA and could either override the AIQA assessment and accept the image for processing, correct the error if possible, or designate the image for reprocessing.

Optical Recognition

Once a digital image was created and accepted, it proceeded to optical recognition, where OMR and OCR software interpreted mark and write-in responses and converted the data to ASCII text.⁷⁰ The optical recognition subsystem performed OMR on the images of all multiple-choice questions. The OMR software determined whether a box was checked, without regard to the possibility of multiple boxes within a question being checked. OMR was not able to determine when a respondent had marked more than one checkbox for a question where a single entry was requested and appropriate. (These were usually the result of respondent confusion and/or lack of compliance with the questionnaire wording and/or design.) Critical fields with multiple responses were sent to KFI for verification. If multiple boxes were checked, OMR passed the answers on to optical answer recognition (OAR), where additional software applied algorithms and determined the single correct box, or answer, to the question. The OAR had the capability to determine the logically correct answer to a multiple-choice question based upon respondent-provided information on the form.

The optical recognition subsystem performed OCR to interpret responses in write-in boxes and then provided the output in ASCII format. This system also detected the presence or absence of write-ins for all open-ended questions and performed further processing through the OCR subsystem or through KFI. The OCR accuracy rates for required fields were 98 percent for alphabetic data and 98.5 percent for numeric data. All alphanumeric entries were sent to keying.

Keying

Keying operations included two processes—KFP and KFI—that employed traditional modes of data entry to compensate for the limitations of the automated technology. If a form could not be successfully imaged or processed through OMR/OCR and KFI, it was sent to KFP. There, clerks manually entered all the information from the form and sent it to a second keyer for verification and, if necessary, correction.

KFI operators interpreted and entered fields initially captured by imaging that did not meet an acceptable level of accuracy and were flagged as “low confidence” interpretations. The images of these fields were displayed on a monitor, and operators keyed all the characters as they understood them from the image. For several situations, keying rules were provided to assist the operators in interpreting the information. Operators also performed a check-box review of critical fields when OMR detected multiple responses.

Quality Assurance

Throughout the development, testing, and production stages of Census 2000, the Census Bureau and its contractor encountered difficulties in agreeing on how to define QA requirements. Discussions of data-quality standards, specifically relating to the questionnaire field-specific anomalies,

⁷⁰ For more information on OMR and OCR technology, see the “Data Capture Outsourcing” section of this chapter.

did not begin until after dress rehearsal concluded, leaving insufficient time for the development and testing of the field-level data-quality assurance subsystem advocated by the Decennial Statistical Studies Division (DSSD).⁷¹ Additional QA alternatives, including a proposal to add an on-site, real-time data-review capability to the DCS2000, were abandoned due to schedule demands and insufficient subject-matter staffing.⁷² Census Bureau and contractor QA specialists also disagreed over the quantitative and qualitative measures for QA. Such differences resulted in the implementation of a QA plan developed by the DCS2000 contractor based on what the contractor determined to be the Census Bureau's requirements.

The Census Bureau required that the OMR engine accurately interpret over 99 percent of the mark entries on the questionnaires (including blank fields being correctly interpreted as blanks), and the DCS2000 incorporated several automated quality checks on OMR. One method used test decks with known values that were run at the beginning of each day at all sites and on all scanners. The decks were then scored and evaluated to verify consistent OMR readings. An internal systems edit checked to see if a batch had an unusually high quantity of questions that were read with more than one box marked. Also, from each site, the DCS2000 contractor collected and reviewed samples of production batches containing different form types.

The OCR software attempted to identify alphabetic and numeric characters contained in the write-in boxes on the census questionnaires. The decision to accept the result of the OCR interpretation was based on a "confidence level" recorded by the OCR engine for each character. If the confidence level was equal to or greater than an established value that indicated a correctly identified character, it was accepted.

A sample of alphabetic and numeric characters, which was recognized with high confidence, was sent to keying for comparison to the original OCR results. The OCR was evaluated by sampling approximately 1 percent of the fields captured. This procedure required the keying of the sample fields by one or two keyers. The decision on the quality of the OCR depended on comparisons between the original batch and the results from Keyer 1 and Keyer 2. KFI employed a similar QA procedure. Approximately 10 percent of randomly selected data input by keyers was compared with the original "low confidence" OCR data. Once compared with the OCR data, if the mismatch rate exceeded a criterion, the batch was rejected and rekeyed.⁷³

During the dress rehearsal, the data capture audit resolution (DCAR) process was added to the DCS2000 design to address concerns over erroneous person records being created by stray marks, respondent confusion, and data capture errors. DCAR consisted of three phases:

- An automated review of the data used to set person panel and roster entries to identify valid and duplicate persons.
- An edit to compare respondent or enumerator responses on household size to a household population count derived from a tally of person panels and roster entries.
- A clerical review of images and an update of data for questionnaires on which response records had conflicting household size information.

This third phase consisted of two types of review: (1) audit count check, which required clerks to review and correct the OCR interpretation of the responses on household size only, and (2) audit status review, which once the count check was complete, required clerks to review the questionnaire image and to set the status of person panels and roster entries.⁷⁴ Of the 126,866,759 returns sent to DCAR, 97.89 percent passed the edit and did not require audit resolution. The

⁷¹ In some instances this lack of field-level QA prevented agency specialists from being able to monitor the quality of data capture. As a result, error rates for some questionnaire fields were 25 to 30 percent and, some rarely answered fields had error rates as high as 70 percent. For more information on data quality, see Joseph Conklin, "Evaluation of the Quality of the Data Capture System and the Impact of the Data Capture Mode on the Data Quality, Final Report," Census 2000 Evaluation K.1.b., March 12, 2003.

⁷² U.S. Census Bureau, "Assessment Report—Data Capture of Paper Questionnaires, Final," Census 2000 Informational Memorandum No. 135, February 19, 2003, pp. 19–20.

⁷³ The KFI QA criterion was determined by pooling the accuracy rates of OMR, OCR, and KFI.

⁷⁴ There were five status categories: valid, blank, invalid, duplicate, and cancel.

DCAR process improved the data quality of Census 2000 by providing a clerical review of OMR/OCR interpretations and correcting data on a considerable number of cases that would otherwise have added to the coverage edit follow-up workload.⁷⁵

While DCAR improved the accuracy of data capture operations, other schedule and contract management challenges prevented Census Bureau subject-matter and QA specialists from assessing data quality using real-time QA measures. Instead, DSSD performed its own check using a sample of image files and intermediate output from each of the DCCs. Following the census, DSSD evaluated the data quality of the DCS2000 using 768,000 short forms and 768,000 long forms, including mailout/mailback forms, enumerator forms, and update/leave forms. For this evaluation, the entire sample was run through the DCS2000, keyed from the digital images, and reviewed by NPC evaluators to determine how much the data captured through automated technology differed from the intent of the respondents.

This evaluation compared two types of errors across three modes of data capture (KFI, KFP, and OCR/OMR): (1) hard-match errors, which occurred when the content of a check-box field was captured incorrectly by the automated technology or by KFI, and (2) soft-match errors, which occurred when the content of a write-in field was captured incorrectly by either mode. The provisional findings of this evaluation were:

- OMR error rates ranged from 1.2 to 1.5 percent (97 percent confidence interval) for all check-box responses that the technology considered readable.
- OCR error rates ranged from 1.0 to 1.1 percent (97 percent confidence interval) for all write-in responses that the technology considered readable (79 percent of such responses).
- KFI error rates ranged from 4.8 to 5.3 percent (97 percent confidence interval) for the responses that the OMR or OCR technology rejected as unclear.

This evaluation also noted that error rates for individual items (defined as a specific response for a specific person line number on a specific form—2,996 in all) were particularly high for 150 person items. Appearing on at least 500 records in the evaluation, these items had error rates ranging from 8 percent to 91 percent.⁷⁶

While no data were available for comparing the accuracy of the Census 2000 data capture technology with the 1990 census technology, an assessment of the system used in the dress rehearsal established a performance standard for OMR and OCR in 1990 of a 2 percent error rate. According to DSSD's evaluation, the OMR and OCR error rates for Census 2000 fell well below this level.⁷⁷ According to this evaluation, across various modes of data capture, the most frequent reasons for failing to capture the intended responses were:

- *Extra check-box*: the output from the automated technology shows more check-boxes marked than are in the scanned image.
- *Missing characters*: the output from the automated technology has fewer characters than the scanned image.
- *Wrong character*: the output from the automated technology and the scanned image have the same number of characters, but the output disagrees with the image in one or more characters.

⁷⁵ Miriam Rosenthal, "DCS 2000 Data Capture Audit Resolution Process, Final Report," Census 2000 Evaluation No. K.1.a., October 24, 2003, pp. iv–3.

⁷⁶ Joseph Conklin, "Evaluation of the Quality of the Data Capture System and the Impact of the Data Capture Mode on the Data Quality, Final Report," Census 2000 Evaluation No. K.1.b., March 12, 2003, Table 8.

⁷⁷ Recent research by Census Bureau subject-matter specialists comparing person records from the sample census unedited file and sample census edited file with questionnaire images indicates that errors within the data capture system resulted in a discernable pattern of erroneous OMR interpretations of labor force responses on Individual Census Reports. See Susan Love and Don Dalzell, Housing and Household Economic Statistics Division, U.S. Census Bureau, "Final Report on the 'Williamsburg Pattern' in Census 2000 Labor Force Responses," memorandum for distribution, February 17, 2006.

In addition to DSSD's evaluation, Rochester Institute of Technology Research Corporation (RITRC) conducted an independent assessment of OCR and OMR accuracy. For this report, RITRC evaluated data quality by comparing "true data capture errors, human interpretation differences, cases of unclear respondent intent, and residual 'truth' errors." According to RITRC, OCR and OMR exceeded performance goals. This assessment rated accuracy for OCR, KFI, and OMR at 99.6 percent, 97.8 percent, and 99.8 percent, respectively. For merged data that combined OCR and KFI, RITRC rated overall write-in field accuracy at 99.3 percent.⁷⁸

Although these two assessments differed in their methods of evaluation, there were some consistencies in their recommendations. Both assert that OCR and OMR technology can be used successfully to process the census and decrease the amount of manual keying required. And both caution that the simplification of questionnaire design and the clear definition of system and QA requirements are critical to the successful use of automation.⁷⁹

Checkout

Checkout marked the final stage of the data capture process. After data capture and review were complete, clerks rescanned bar codes of all questionnaires to determine if the DCS2000 system had successfully created a capture record for each processed questionnaire. This rescanning also verified that DSCMO had received the associated Title 13 data. Forms containing image or data discrepancies were redirected back into the data capture process. Checkout consisted of two steps. First, clerks scanned or keyed the census ID bar code from each form and removed all forms lacking a Title 13 acknowledgment. During Step 2, these forms were sent for reprocessing as follows:

- KFP: damaged, completed with red ink, blank, or second time through checkout.
- Imaging: poor image, never scanned, double feed.
- Disposal or storage (KFP forms were stored indefinitely).
- Manual check-in.
- Reconstruction tray—long forms with lost form integrity to be rescanned.

After a successful checkout in which data were transmitted to headquarters and acknowledged, the forms were authorized for temporary storage and destruction.

Closeout

At the completion of data capture operations, the contractor requested approval from the Decennial Management Division (DMD) to close out the DCC. Each processing area in a DCC was responsible for ensuring that all equipment, supplies, and services were discontinued. Additionally, the phase-out plan for releasing the staff was initiated by the human resources personnel at the respective site. The following activities were performed at the conclusion of data capture at the DCCs:

- Each DCC made provisions for the disposition of all equipment, supplies, and facilities. Unless DMD directed otherwise, items were retained by the DCC contractor or were disposed of in an alternative manner.
- Each DCC arranged for the storage of documentation that might be required for future maintenance or auditing purposes. This documentation included contract deliverables and operational reports required by the Census Bureau.

⁷⁸ RIT Research Corporation, "DCS 2000 Data Quality, v.2.1, Final," September 20, 2002, pp. 1–3.

⁷⁹ Conklin notes that to assign a single-number accuracy rate to the performance of automation would obscure the considerable differences in accuracy rates among various error and form types. Joseph Conklin, "Evaluation of the Quality of the Data Capture System and the Impact of the Data Capture Mode on the Data Quality, Final Report," Census 2000 Evaluation No. K.1.b., March 12, 2003, p. 20.

- Each DCC completed a collection of metrics that assessed the performance of the operation. These metric reports were retained throughout the operation, and a cumulative report was provided to the program office of the data capture services contractor and to the Census Bureau.
- Each DCC prepared a project abstract that described the staffing, scope, span, time and length of effort, project costs, and customer references. The information contained in the abstract was to be used as a reference on the historical data of the project.
- Each DCC prepared and submitted a post-project review report describing the “lessons learned.”
- Each DCC removed all data from servers.

Forms Disposal

Once the processed questionnaires were verified as captured, they were shredded 15 days after receipt of data confirmation. Exceptions to this included enumerator questionnaires, Asian-language forms, and questionnaires that were keyed from paper. These were retained for various reasons. Congress and the Office of Inspector General required that all enumerator questionnaires be held for further review based on reports and evidence of possible fraud in census offices.⁸⁰ TRW Inc. created a library index of these questionnaires and stored them at NPC along with the forms that were keyed from paper. After approval by Congress in May 2001, the NPC destroyed these forms.⁸¹

Data Archiving

Under Title 44 of the U.S. Code, the Census Bureau is required to maintain confidentiality of individual decennial response data for 72 years, after which, the census schedules are released to the public. After the Census Bureau completed all computer processing to eliminate duplicate records or combine multiple returns from the same household, it provided the National Archives and Records Administration (NARA) with the Title 13 ASCII files. In discussions with Census Bureau officials in 1995, NARA indicated that a final edited (verified) master index file that could be used to retrieve census data by name, house number, street name, city, state, and ZIP Code would meet their “essential” archiving requirements. However, given the interest in genealogical research, NARA also stated that microfilm of the scanned images was “desirable.”⁸² Acknowledging that requiring microfilm of the questionnaire images would increase the cost of Census 2000, NARA agreed that the ASCII data (and other administrative and geography files) would be sufficient to meet federal archiving requirements.⁸³ In June of 2000, however, after responses from several professional groups and organizations representing records users, NARA requested microfilmed images of Census 2000 questionnaires.⁸⁴ To satisfy this requirement, the Census Bureau, in cooperation with NISH, awarded Business Technology Career Opportunities of Wichita, KS, and its partner, Service Source of Alexandria, VA, a \$27 million contract for transferring the 625 million page images from digital tape to microfilm.⁸⁵

⁸⁰ See Chapter 5, “Data Collection,” for more information on reenumeration in selected LCOs.

⁸¹ U.S. Census Bureau, “Assessment Report: Data Capture of Paper Questionnaires,” Census 2000 Informational Memorandum No. 135, February 19, 2003, p. 14.

⁸² National Archives and Records Administration, “Preserving Census 2000 Records: A Report of the Census 2000 Working Group of the National Archives and Records Administration,” memorandum, College Park, MD, March 1, 1995.

⁸³ National Archives and Records Administration, “Census 2000 Comprehensive Record Schedule,” SF-115 for Job No. N1-29-00-2, June 14, 2000. See also “Microfilming of Census 2000 Image Files, SOL #52-SOBC-1-0001,” *Commerce Business Daily*, May 18, 2001.

⁸⁴ National Archives and Records Administration, “National Archives to Preserve Digital Images of Census 2000 Questionnaires,” press release, June 8, 2000, <<http://www.archives.gov/press/press-releases/2000/nr00-82.html>>, accessed June 20, 2006.

⁸⁵ For more information on modifications to the DCS2000 contract, see the “Data Capture Outsourcing” section of this chapter. See also National Archives and Records Administration, “Census 2000 Comprehensive Record Schedule,” SF-115 for Job No. N1-29-00-2, June 14, 2000, and “Extension to Contract No. 50-YABC-7-66010 for the Transition of the Production DCS2000 Systems to a Post-Decennial Environment,” *Commerce Business Daily*, PSA No. 2737, November 30, 2000.

HEADQUARTERS PROCESSING

For Census 2000 the Census Bureau consolidated all processing functions at headquarters with an integrated and interdependent network of headquarters data processing systems.⁸⁶ Once received at headquarters, census data continued through a series of processing steps that organized and integrated the information to produce a “normalized” data file for the creation of Census 2000 data products. This process began with the compilation of the decennial response file (DRF) and ended with the final edited detail files—the 100 percent detail file (HDF) and the sample edited detail file (SEDF) containing sample data from the long forms.

Non-ID Processing

Every address in the census had a unique identifier, the master address file (MAF) identification (ID) number. This number linked each address to its census response. Most census addresses were assigned a unique ID number prior to census enumeration operations, and most census questionnaires had a preprinted and bar-coded MAF ID. However, some operations used questionnaires without preassigned MAF IDs. These response records were captured using a temporary processing ID for control and tracking purposes. The non-ID operation attempted to assign an MAF ID to those responses.

Headquarters processing identified the non-ID records and forwarded them to the Geography Division (GEO) for processing. GEO provided a census ID number (MAF ID) for each address it could either match or geocode and it updated the MAF with new housing unit addresses found among non-ID responses. GEO forwarded the results of the non-ID process to the Decennial Systems and Contracts Management Office (DSCMO) which added the new addresses to the decennial master address file (DMAF). Response records without an initial MAF ID were divided into three groups, designated Types A, B, and C:

Type A records consisted of housing unit addresses of responses from the Be Counted program, the Telephone Questionnaire Assistance (TQA) operation, and the service-based enumeration (SBE) operation. Type A also included usual home elsewhere (UHE)⁸⁷ addresses provided on group quarters (GQ) questionnaires (GQ/UHE addresses) and UHE addresses provided on enumerator questionnaire responses from the in-mover and whole household UHE coverage improvement probes. For these records, GEO conducted an automated match of city-style (i.e., house number and street name) and non-city-style addresses to the MAF. GEO also carried out an automated process to geocode city-style addresses that could not be matched to the MAF in the automated process.

GEO clerks carried out interactive telephone and computer-assisted operations at the NPC to match and geocode records that could not be matched or geocoded in the automated processes. If the initial attempt to clerically match or geocode an address failed, the address was compared to a commercially available database of addresses in order to obtain a telephone number and correct any deficiencies in the address. If appropriate, a second attempt was made to clerically match or geocode the address based on the updated information. If still unsuccessful, the clerical staff used the telephone number to contact the respondent and correct any errors in the address information. If corrections were made, another attempt was then made to match or geocode the address.

New addresses (i.e., those not matched to addresses already on the MAF) that could be geocoded were added to the DMAF. Census plans specified that existence of new Type A addresses added to the DMAF through the non-ID process must be confirmed by the field verification (FV) operation. Enumerators visited the location of the new addresses in the FV operation to determine whether the address existed as a census housing unit on April 1, 2000.

Type B records included a subset of responses from the Be Counted program that indicated the respondent had no usual home on April 1, 2000. These responses were included in the GQ universe if GEO identified the local census office (LCO) geography that contained the address. Type B

⁸⁶ See “Automation Infrastructure” section in this chapter for information on individual systems.

⁸⁷ A usual home elsewhere address is a Census Day address reported by a respondent that is different from the address at which the respondent is interviewed.

addresses were geocoded only to the geographic area of the LCO since the only geographic information collected was the place and county where the person without a usual residence stayed on Census Day. New Type B address locations geocoded to the LCO geography were added to the DMAF.

Type C records included housing unit addresses that were added to the census through the update/leave (U/L), urban update/leave (UU/L), nonresponse follow-up (NRFU), coverage improvement follow-up (CIFU), transient-night, or GQ enumeration programs. GEO assigned an MAF ID to all Type C addresses. GEO attempted first to match the address to an existing address on the MAF. If no match was found, and the address could be geocoded, the address was added to the DMAF.⁸⁸

Overall, the geocoding and matching operations made effective use of the interactive mapping and geocoding system technology. This system enabled clerical staff assigned to matching and geocoding operations to simultaneously view both the MAF and TIGER® databases while calling respondents to verify addresses. This use of automation contributed to an increase in production rates, but the workload for Type A and Type B records for non-ID processing was larger than anticipated, causing a considerable number of difficulties in identifying and processing all cases. Almost 2.3 million of the 4.2 million Type A and Type B non-ID cases were included in error. Headquarters processing did not apply the filter to exclude ineligible GQ/UHE returns from the non-ID process prior to sending them to GEO for identifying returns requiring the assignment of an MAF ID through the non-ID process. As a result, 2,281,712 GQ returns were erroneously included in the non-ID process, while 659,566 GQ returns were legitimately included. Additionally, GEO received over a million records too late to be processed in subsequent collection and processing operations.⁸⁹

Decennial Response Files (DRF)

The DRF was a set of files containing all person records and housing unit records obtained from census enumerations that could be assigned a census ID. The DRF provided a consistent data format across various modes of input, and several critical processes were run on the DRF records. Discrepancies between the reported number of occupants and the number of people in households for which there was not room on the main questionnaire were linked to the main household record; and household and person records to be included in the census, and therefore placed on the census unedited file (CUF), were identified.

Processing of the DRF occurred in two stages. The compilation of response files for DRF1 began on March 7 and continued until September 17, 2000. Inputs to DRF1 included daily transmissions from DCS2000, TQA, and Internet Data Collection. Also included were key from paper, low-volume GQ (i.e., Puerto Rico, stateside service-based enumeration, and Shipboard Census Reports), and the research and experimentation forms keyed at the National Processing Center (NPC) outside the DCS2000 system. On a flow basis, the DSCMO converted or “normalized” into one file format, response data from 82 different questionnaire types transmitted in one of 15 different formats. Once normalization was complete, the DSCMO validated every data field by checking for illegal characters and comparing values against specific capture ranges. DRF1 processing also incorporated edits or deletes transmitted from the coverage edit follow-up (CEFU) operation for households with more than six members or with count discrepancies.⁹⁰ During the identification step, the DSCMO identified and processed valid person records by applying a data definition to every DRF1 person record associated with a census ID. The definition was based on the 100 percent population items and name fields on the person records. For a person record to remain in the DRF, two or more of the six fields had to be completed.⁹¹ Once all field data collection and Pass 1 data

⁸⁸ Karen Medina, U.S. Census Bureau, “Assessment Report for Non-ID Questionnaire Processing (Including BCF/TQA Field Verification),” Census 2000 Informational Memorandum No. 141, September 2003.

⁸⁹ For greater detail on the distribution of non-ID processing errors, see Nicholas S. Alberti, *Data Processing in Census 2000*, Census 2000 Testing Experimentation, and Evaluation Program Topic Report No. 7, TR-7, (U.S. Census Bureau: Washington, D.C., 2004), pp. 18–19; Karen Medina, U.S. Census Bureau, “Assessment Report for Non-ID Questionnaire Processing (Including BCF/TQA Field Verification),” Census 2000 Informational Memorandum No. 141, September 2003.

⁹⁰ See Chapter 5, “Data Collection,” for information on the CEFU operation.

⁹¹ 100 percent population data included relationship, sex, age, date of birth, Hispanic origin, and race.

capture activities concluded, final MAF extracts and all CEFU data were delivered to the DSCMO, and a final DMAF was created for each LCO. This marked the completion of the first stage of DRF processing.

Processing of DRF2 began on August 17 and concluded on September 18, 2000. This process consisted of three steps: reformatting DRF1 data, linking continuation forms with their parent enumerator forms, and implementing the primary selection algorithm (PSA) to resolve the multiple responses received for some units. DRF2 processing began by sorting DRF1 data into LCO files by block and ID and then grouping response records with the same ID together. Person records determined to be data defined remained on the DRF2 and were eligible to be selected by PSA. Those that were not data defined remained on the DRF2 for evaluation purposes.

The next step in DRF2 processing involved resolving multiple returns for the same ID. Given the variety of response options available for Census 2000, a single household may have been enumerated on more than one questionnaire—for example, through mail returns, TQA or IDC, or follow-up operations such as CEFU, NRFU, or CIFU. DRF2 processing compared response records with the same census ID and determined which responses would be combined to form the census household. At three stages of the DRF2 process, a status and an expected household population count were set for each housing unit record that had the potential to become a “parent” form.⁹² When the multiple returns were merged during the linking step, the return-level record for the parent form was retained and a variable set to identify that the form was merged. Once form linkage was complete, the DSCMO determined the expected population count for every return on the DRF2 that was to be used in the application of the PSA.⁹³

Primary Selection Algorithm (PSA)

The application of the PSA resolved the issue of more than one census record being received for a housing unit. It did this by comparing the responses, eliminating the redundant ones, and determining the status and the number of person records to include for each housing unit. The PSA software performed four functions. It matched persons between returns; constructed PSA households; selected the primary PSA household; and selected additional persons for the census households that were not in the primary PSA household. In the summer of 1999, a team of Census Bureau staff from the DMD, DSSD, DSCMO, Population Division, and Housing and Household Economic Statistics Division partnered with a private sector firm to develop and test the PSA software. Preproduction testing continued from January through August 2000.⁹⁴

The PSA defined 2,656,951 returns as ineligible for the PSA process. Approximately 8 percent of census IDs on the DRF, or nearly 9 million returns, had more than one eligible return. For these eligible returns, the PSA process identified sets of associated persons at each census ID, designating these sets as PSA households. Over 73 percent of census IDs with more than one eligible return had only one PSA household. However, approximately 2 percent of the census IDs had two or more PSA households. For these census IDs, the PSA determined the primary PSA household to be used in further processing by sequentially applying detailed selection criteria to the PSA households until one was selected.⁹⁵ A final housing unit status and population count for each census

⁹² A “parent” form was the initial form of multiple forms used for a single enumerator interview. The parent form contained the original label, record of contact, introduction, housing questions, and interview summary. All questionnaires with additional person data that were supplemental to a parent form were called “child” forms.

⁹³ U.S. Census Bureau, “Program Master Plan: Census 2000 Decennial Response Files Program,” Census 2000 Informational Memorandum No. 85, November 25, 2000, p.10.

⁹⁴ Teresa Angueira, “Decennial Response File 2 (DRF2)/Primary Selection Algorithm (PSA) Software Quality Assurance Development Plan,” Census 2000 Informational Memorandum No. 118, January 31, 2002; Stephanie Baumgardner, “Analysis of the Primary Selection Algorithm,” Census 2000 Evaluation No. L.3.a., November 26, 2002, pp. i–iii.

⁹⁵ Stephanie Baumgardner, “Analysis of the Primary Selection Algorithm,” Census 2000 Evaluation No. L.3.a., November 26, 2002, pp. ii–iii.

housing unit was then set. The completed PSA process provided an updated version of the DRF2.⁹⁶ Headquarters processing then created the 100 percent census unedited file (HCUF) using the results of the updated DRF2 and the address-level information from the DMAF.

Creation of the 100 Percent Census Unedited File (HCUF)

For the 1990 Census, the final 1990 census data capture file, the address control file, and the capture control file combined to create the equivalent of the Census 2000 100 percent census unedited file (HCUF). This 1990 file reflected the results of the census response records selected by the primary selection algorithm applied to the data capture file and the final address control file. The Census 2000 HCUF contained all the household and person records included in Census 2000. The HCUF consisted of the data records only for the addresses that were to be included in the final census count, and to determine the count of persons at each address. HCUF construction proceeded in three stages. First, data from the final DRF2 and the DMAF were used to determine which housing units were to be included in the census. Each unique DMAF address was determined to be either a potential census housing unit or an address that did not identify a unique housing unit.⁹⁷

Housing Unit Status

Addresses determined not to be housing units fell into two groups: kills and resolved deletes. Addresses on the DMAF found not to identify a housing unit as of April 1, 2000 were described as kills. These were identified primarily on the basis of address list development data. Resolved deletes were identified primarily on the basis of housing unit response data. A DMAF address became a kill if the census could find no recent evidence of its existence.⁹⁸ The primary means by which a DMAF address would be classified as a kill were if no mail return was received from the address, and it met one of the following criteria:

- Double delete: Both the Block Canvassing and Local Update of Census Addresses Field Verification operations classified the address as a “delete.”
- Old delivery sequence file address: Though placed on the DMAF by virtue of being a residential address on one of the USPS delivery sequence files from 1997 or 1998, the address was no longer a residential address on any of the USPS delivery sequence files in 1999 and 2000.
- The address was identified as a delete by an enumerator in a Census 2000 operation and no evidence was received indicating that the address was an existing residential address. Also in the first stage of HCUF creation, response data from both the DMAF and the DRF were used to assign status and population count to the remaining potential housing units. Possible statuses included occupied, vacant, resolved as occupied (unknown pop), occupancy status unknown, and housing unit status unknown. Resolved as occupied (unknown pop) indicated that the housing unit was occupied but the population count was unknown. Occupancy status unknown indicated that the housing unit existed but could have been either occupied or vacant. When the address might have been an occupied housing unit, a vacant housing unit, or not a census housing unit at all, its status was designated as unknown.⁹⁹

⁹⁶ These findings were confirmed by the Accuracy and Coverage Evaluation as well as studies about personal file duplication following the census. See National Research Council, *The 2000 Census: Counting Under Adversity*, pp. 240–43, (The National Academies Press, Washington, D.C.: 2004).

⁹⁷ Kim Jonas, “Census Unedited File Creation, Final Report,” Census 2000 Evaluation L.4, July 31, 2003, pp. 1–3.

⁹⁸ James B. Treat, “Specification of the Kill Universe on the Decennial Master Address File for Census 2000,” DSSD Census 2000 Procedures and Operations Memorandum Series #D-13, December 21, 2000.

⁹⁹ See Nick Alberti, “Specifications for Assigning the Housing Unit Status and Population Count of the Hundred-Percent Unedited File Prior to the Imputation of Unclassified Units,” DSSD Census 2000 Procedures and Operations Memorandum Series #D-14, January 19, 2001.

Imputation

Imputation is a term for the creation of data when required information is missing from a survey or census. Approximately 5.8 million people (2.1 percent of the total population) had all their 100 percent characteristics imputed in Census 2000. Designed to correct for nonresponse, imputation takes several forms. The Census Bureau divided these imputations into two categories—count imputation and characteristics imputation.

Count imputation. At the end of follow-up activities and data capture processing, some census housing unit records did not contain information on the number of persons or did not contain information on whether the census housing unit was occupied or vacant or whether the record should be deleted from the final list of housing units. These omissions may have been from respondents not providing correct information or from an unanticipated operational obstacle. In such cases the Census Bureau imputed the housing unit status and the number of persons for any occupied census housing unit without household size.

Since missing housing unit status and population count data affected the population total, only count imputation was required for the official population counts due December 31, 2000. Other missing data such as missing demographic data were handled during the characteristic imputation procedure which occurred after count imputation was completed. For Census 2000, production for count imputation started in mid-September 2000 and was completed by early October 2000.

Under the assumption that housing unit status and number of persons living in a housing unit are more similar in a nearby neighborhood than a far away community, the Census Bureau used a nearest-neighbor hot deck imputation method.¹⁰⁰ Using this method, data from the closest available neighbor were used to fill in the missing data. Geographical closeness of housing units was determined by sorting all housing units and group quarters within a tract by block number, street name, and house number. Based on this sort sequence, searches were conducted to find a donor for a unit with missing data. The unit with missing data was known as a donee. The nearest available unit meeting specified requirements (see Table 6-9) was used as a donor to fill in the data for the donee. The donee took the donor's housing unit status and population size as its own.

Count imputation consisted of three distinct processes defined as:

- **Household Size (Count) Imputation**—The Census Bureau imputed a population count for a housing unit when Census Bureau records indicated that the housing unit was occupied, but did not show the number of individuals residing in the unit.
- **Occupancy Status Imputation**—When Census Bureau records indicated that a housing unit existed but not whether it was occupied or vacant, the agency imputed occupancy status (occupied or vacant), and, if the unit were imputed to be occupied, the household size of the donor record was used.
- **Housing Unit Status Imputation**—When the Census Bureau's records had conflicting or insufficient information about whether an address represented a valid, unique housing unit, the process first imputed for the status of the unit (occupied, vacant, delete), then, if occupied, the household size of the donor record was used.

¹⁰⁰ Hot deck imputation involves the assignment of values from a set of stored values collected from other households. The phrase "hot deck" is used to describe the source because the deck is constantly refreshed by newly processed cases.

Table 6-9.
Summary of Count Imputation Categories

Type of imputation	Estimation category	Donees	Donors
Household size	1a. Single units 1b. Multiunits	Occupied units with undetermined population count.	Occupied units with a population count from enumerator-completed forms.
Occupancy status	2a. Single units 2b. Multiunits	Units known to exist (but occupancy status not determined).	Occupied or vacant units from enumerator-completed forms.
Housing unit status	3a. Single units 3b. Multiunits	Addresses not determined to be housing units.	Occupied, vacant, or deleted units from enumerator-completed forms.

The Census Bureau subdivided the three types of imputation categories into single housing units and multiunits to form six estimation categories. It conducted nearest-neighbor hot deck imputation separately for single units and multi-units within each of these three imputation categories. Household size imputation was done first, followed by occupancy status imputation and housing unit status imputation.¹⁰¹ During Census 2000 a total of 1,172,144 persons, or 0.42 percent of the total population was added to the apportionment count through count imputation. While this rate was in line with censuses before 1990, it was higher than the rate of count imputation in the 1990 Census.¹⁰²

Characteristics imputation. Characteristics imputation supplies all the data for people for whom one or more question items were not reported. The Census Bureau used whole-person characteristics imputation to impute all person characteristics for those whose census records did not contain two or more of the 100 percent population data items or name (those who were not data-defined persons.) During Census 2000, 4,602,122 person records representing 1.64 percent of the total population were imputed through the whole person characteristics imputation process.¹⁰³ The Census Bureau imputed whole person characteristics for two categories of cases in Census 2000—whole household imputation, and within household imputation.

Whole household imputation is performed for households containing no data-defined persons. Such households require all characteristics data to be imputed for each of the household members. This process uses substitution to replicate all of the 100 percent person data items (sex, age, date of birth, relationship, Hispanic origin, and race) from a hot deck nearest neighbor household donor pool record of the same household size.¹⁰⁴ A household may contain no data-defined persons because it was either enumerated with only a count provided, or was determined through count imputation to be occupied and supplied with a population count. During Census 2000, a total of 1,464,793 households were substituted nationwide in Census 2000. These represent 1.39 percent of the 105.5 million occupied housing units. Within these substituted households, there were 3,441,154 substituted persons. These persons account for 1.26 percent of the 273.6 million housing unit persons in the nation.¹⁰⁵

Within household imputation is performed for households containing at least one data-defined person and other persons with missing data. The imputation process allocates missing values for

¹⁰¹ Inez Chen and Andrew Kilmer, "Census 2000: Overview of Count Imputation—Reissue of Q2," DSSD Census 2000 Procedures and Operations Memorandum Series Q-78, March 18, 2002; Further details can be found in Memorandum Q-34 of the DSSD Census 2000 Procedures and Operations Memorandum Series, Subject: Census 2000 Specifications for Imputing Housing Unit Status and Population Counts.

¹⁰² Fay F. Nash, *ESCAP II: Analysis of Census Imputations, Report No. 21*, September 24, 2001, pp. 1–4.

¹⁰³ Those persons whose records contained two or more of the 100 percent population data items or name—known as data-defined persons—did not undergo whole person characteristics imputation. For such persons, missing data items were imputed through the edit process of assignment during which the responses for missing data items can be determined based on information provided on the same record by that same person.

¹⁰⁴ Substitution is the replication of a full set of data when records without sufficient information are found in the edit process. For more information on substitution in the edit and imputation process, see Susan Love and Don Dalzell to Daniel Weinberg, memorandum "Definitions of Substitution," U.S. Census Bureau, May 9, 2001.

¹⁰⁵ Kevin J. Zajac, "Analysis of Imputation Rates for the 100 Percent Person and Housing Unit Data Items from Census 2000, Final Report," Census 2000 Evaluation B.1.a, September 25, 2003, p. vii.

individual person characteristics data items on the basis of other reported information for the person or household, or from other persons or households with similar characteristics. Census 2000's 1,255,553 within household imputations resulted in 2,333,112 persons with all person characteristics imputed, marking a considerable increase over the 1990 census.¹⁰⁶

The Census Bureau's use of automated hot deck imputation began in 1960 and subject-matter specialists in population and housing have continued to refine specifications for edit procedures.¹⁰⁷ Census 2000, however, placed an unprecedented amount of reliance on automated imputation. Unlike earlier censuses which emphasized the use of clerical edits and repeated telephone and field follow-up to correct for missing values Census 2000 made more extensive use of hot deck matrices. This emphasis on automation rather than clerical edits and follow-up was due primarily to concerns over managing operation costs and schedule constraints. Given that the definition of imputation is sometimes interpreted in various ways across the Census Bureau, it is difficult to compare rates from previous censuses. Census 2000 imputation rates marked an increase over past censuses, which relied less on automated imputation and more on telephone and field follow-up operations to fill in missing data.¹⁰⁸ This increase may also be attributed to data processing problems. In one instance, an error in processing enumerator forms resulted in the unnecessary occupancy imputation of roughly 145,000 housing units. In addition, delays in the verification process for GQs resulted in the unnecessary imputation of housing unit status for 207,000 housing units.¹⁰⁹

Duplicate Delete Operation

Identification of duplicate addresses marked the final step in the HCUF process for housing units. In addition to the availability of multiple response modes during Census 2000, the Census Bureau's use of multiple sources for addresses combined with conservative rules for eliminating potential duplicates to increase the number of potential duplicates. Although the census design incorporated the use of the PSA to resolve multiple responses for the same MAF ID, the PSA was not designed to detect or eliminate duplicate addresses on the MAF.¹¹⁰ After site visits in June 2000 revealed evidence of significant housing unit duplication, Census Bureau staff developed the duplicate delete operation to correct a potential overcount of housing units. Designed and conducted in the summer and fall of 2000, this operation employed two primary methods to identify potential duplicate addresses: address matching based on characteristics of the address derived from MAF data, and person matching based on name and date of birth.

Scheduling deadlines required the Census Bureau to conduct the identification of duplicate addresses in two phases. During phase one a provisional list of duplicate addresses was identified and address and person matching were carried out independently. This process yielded 2,645,387 matched pairs of addresses. Addresses with one of more exact person matches and similar households were paired. After identifying kills and addresses given a status of delete, one address was

¹⁰⁶ Fay F. Nash, *ESCAP II: Analysis of Census Imputations, Report No. 21*, September 24, 2001, pp. 1–4; Signe I. Wetrogan and Arthur R. Cresce, *ESCAP II: Characteristics of Census Imputations, Report No. 22*, October 12, 2001, pp. ii–3. See also Kevin J. Zajac, “Analysis of Imputation Rates for the 100 Percent Person and Housing Unit Data Items from Census 2000, Final Report,” Census 2000 Evaluation B.1.a, September 25, 2003.

¹⁰⁷ Although hot decks were used in 1960, the Census Bureau's first use of cold deck imputation—so called for the sets of computer punch cards containing numeric values from a previous survey or census—dates back to 1940 when was the process was used to impute age.

¹⁰⁸ National Research Council, *The 2000 Census: Counting Under Adversity*, (The National Academies Press: Washington, D.C., 2004), pp. 133, 271–96, 406, 457–67.

¹⁰⁹ Nicholas S. Alberti, *Data Processing in Census 2000*, Census 2000 Topic Report No. 7, TR-7, (Washington, D.C.: U.S. Census Bureau, 2003) pp. 26–35. See also, Robert Fay, “The 2000 Housing Unit Duplication Operations and their Effect on the Accuracy of the Population Count,” Proceedings of the Annual Meeting of the American Statistical Association, August 5–9, 2001; Teresa Angueira to Preston Jay Waite, U.S. Census Bureau, Census 2000 Informational Memorandum No. 110, “Initial Research on Count Imputation in Census 2000,” August 10, 2001.

¹¹⁰ For more information on the development of the master address file (MAF) see Chapter 8, “Addresses and Questionnaire Printing and Mailing.”

selected from each remaining pair. Those addresses not selected—including 2,411,743 MAF IDs—were flagged as provisional deletions.¹¹¹

Phase one identified, but did not eliminate addresses from the HCUF. After the HCUF was complete, the duplicate delete operation proceeded to phase two during which the results of phase one were used to identify which of the provisional deletions from phase one would be retained on HCEF. In phase two additional information on address matching and person matching combined to decide which of the provisional deletions to reinstate. Additional person matching used a modified version of the Census Bureau's probabilistic matching methods. At the completion of phase two, a total of 1,392,686 HCUF addresses were identified as duplicate addresses and not retained on the HCEF.¹¹²

Group Quarters Processing

GQ response data were processed separately from the housing unit data until the final step of the HCUF processing when the response records from both universes were placed on the same file. The Census Bureau relied heavily on the number of GQ questionnaires completed and captured by the DCS2000 to determine the population of each GQ. Individual GQ questionnaires were not tracked during the enumeration processes. Clerical counts of the number of questionnaires at several points of field processing and a count of records by the DCS2000 were recorded. The count of the number of questionnaires was recorded at five points in the post-enumeration processing:

- By the enumerator immediately following the enumeration of a GQ.
- By the LCO staff when the questionnaires were received.
- By the LCO staff when the questionnaires were shipped to the NPC.
- By the NPC staff when the questionnaires were received.
- By the DCS2000 during the data capture of questionnaires.

The counts listed above formed the basis for determining the final population count for each GQ. Other processes that contributed data were:

- The results of telephone follow-up interviews with GQ establishments that initially refused to be enumerated. No questionnaires were returned for these GQs. The Census Day population of each GQ was ascertained by the follow-up interview.
- Identification of BCF questionnaires with a GQ address.
- Identification of housing unit questionnaires with a reported UHE address for a GQ.
- Unduplication of persons at SBE Facilities.
- Identification of GQ questionnaires with a reported UHE address for a housing unit.

Although residents of all types of GQs were allowed to report UHE (i.e., a Census Day residence other than the GQ at which they were enumerated) only questionnaire data for eligible UHE responses were to be sent to the non-ID processes. Only persons with eligible UHE responses could be removed from the GQ universe and included in the housing unit universe. Eligibility was determined by the type of GQ from which the questionnaire was received and response to a screening question which identified a person's primary residence.

¹¹¹ Susan M. Miskura to Preston Jay Waite, U.S. Census Bureau, "Results of Reinstatement Rules for the Housing Unit Duplication Operations," Memo, November 21, 2000.

¹¹² See Robert Fay, "The 2000 Housing Unit Duplication Operations and Their Effect on the Accuracy of the Population Count," Proceedings of the Annual Meeting of the American Statistical Association, August 5–9, 2001, for more information on the two-phase operation of identifying deletes and reinstating provisional deletes. For information on reinstatement rules, see Howard Hogan, "Specification for Reinstating Addresses Flagged as Deletes on the Hundred Percent Census Unedited File," DSSD Census 2000 Procedures and Operations Memorandum Series #D-11, November 7, 2000.

Resolution of Missing Data

GQ processing dealt with difficulties surrounding a potentially large amount of missing data. In May 2000, the NPC reported that a large number of GQ questionnaires did not have GQ Identification (ID) numbers on them and/or had no associated control sheet. Census Bureau headquarters staff quickly designed and implemented procedures to clerically review these questionnaires and, if possible, identify them with the correct GQ. The staff reviewed an estimated 700,000 questionnaires during this operation.

Each GQ questionnaire received a unique barcode and number, however the barcode was not used to track GQ questionnaires from enumeration through data capture. This oversight required enumerators to transcribe the 14 digit GQ identification number on each GQ questionnaire. When this was not done or was done incorrectly it was difficult and sometimes impossible to identify the GQ at which the respondent was enumerated.

An interdivisional team of staff knowledgeable about GQ enumeration examined the counts of questionnaires after data capture by the DCS2000. This review was not originally part of the design for GQ processing. The team found that the data capture was incomplete in several ways:¹¹³

- No questionnaires were received for a number of GQs which were believed to have refused Census Bureau attempts to enumerate them.
- The count of questionnaires for a number of GQs was far less than projected by pre-enumeration operations.
- A number of GQs had a higher count of questionnaires sent to NPC by the LCOs than were captured by the DCS2000.

An unscheduled telephone follow-up operation was implemented to address the first two of the count deficiencies described above. This follow-up ascertained the Census Day population count for GQs but did not collect the demographic data of residents. A total count of 101,598 persons (representing 1.3 percent of the total GQ population) was added to the GQ population as result of this follow-up. About 4.4 percent of GQ residents at hospitals were enumerated by this follow-up.

DSSD designed a procedure to derive a count of the expected number of persons enumerated at GQs to mitigate the problems posed by the last of the three count discrepancies. When the aggregate count of forms shipped to the NPC for a Special Place was higher than the aggregate count of forms captured, the difference in these two counts was allocated to the GQs within the Special Place proportional to the differences in the two counts for each GQ. Collectively, all these operations added about 200,000 persons to the Census 2000 GQ population of 7,825,407. As a result, it was necessary to impute all the required demographic data for 2.6 percent of the Census 2000 GQ population.

Processing of Responses With a Usual Home Elsewhere Address

The GQ processing recovered from the erroneous routing of returns for GQ residents reporting UHE addresses to the non-ID process. If a UHE address was confirmed to be a housing unit, GQ responses sent to the non-ID process could be removed from the GQ universe and placed in the housing unit universe. Hence, it was important to identify ineligible GQ UHE responses in order to prevent them from being erroneously removed from the GQ universe. During GQ processing, 659,566 responses with a UHE housing-unit address were correctly removed from the GQ universe. Additionally, 150,315 responses were incorrectly removed from the GQ universe because they were incorrectly identified as having a UHE address. GQ processing erroneously sent nearly 2.3 million GQ responses to the non-ID process.¹¹⁴

¹¹³ A portion of the missing questionnaires can be attributed to the missing GQ ID numbers on some forms and inability of the Census Bureau to associate them with the appropriate GQ.

¹¹⁴ There were 1,892,742 responses with a UHE address collected from those types of GQs that made them ineligible to be sent to the non-ID process. There were 388,970 responses that were incorrectly identified as having a UHE address. See Kimball Jonas, "Group Quarters Enumeration, Revision 1," Census 2000 Evaluation E.5, August 6, 2003.

Sample Census Unedited File (SCUF)

During Census 2000 the shift from an adjusted census design to a traditional census not only required a change in data capture operations with the adoption of a two-pass procedure, it also prompted a change in the processing of the census unedited file (CUF).¹¹⁵ In March 2000, the Census Bureau decided to divide the planned CUF into two separate files—the hundred percent census unedited file (HCUF) and the sample census unedited file (SCUF). The HCUF contained the unedited 100 percent items (and any sample items needed for the 100 percent edit) for all forms. It also contained write-in fields and was organized in collection geography. The SCUF contained the unedited 100 percent items and sample items for all sample housing units and their residents and all sample persons in the GQs.¹¹⁶ At the conclusion of the second data capture pass, DSCMO linked sample data to the DRF, after being matched to the HCUF, to produce the SCUF which was processed in the same fashion as the HCUF with additional weighted counts defined for the sample data to produce the sample census edited file (SCEF). Additional recodes and disclosure avoidance processes are applied to the SCEF to produce the SEDF for data tabulation.

Detail File Creation

Once the HCEF and SCEF were complete, the files proceeded through additional processing steps in the PRPS preparing them for tabulation. To produce the hundred percent detail file (HDF), the Census Bureau assigned the records to tabulation geography and applied standard disclosure avoidance techniques to the base edited files. As it had during the 1990 census, the Census Bureau employed a disclosure avoidance technique called data swapping. Designed to protect confidentiality, this technique added a small amount of uncertainty to the data summaries for small areas, such as census blocks, including those used for legislative redistricting.¹¹⁷ After the application of disclosure avoidance, the HDF was ready for tabulation and the development of census data products.

¹¹⁵ See Chapter 11, “Legal Issues,” for further information on sampling and adjustment.

¹¹⁶ Michael Longini to Susan Miskura, U.S. Census Bureau, “Census 2000 Unedited Data Files,” 2000 Census DSCMO to DMD Memorandum Series No. 00-02, March 3, 2000; Susan Miskura, “Census 2000 Written Responses Within Unedited Data Files,” Census 2000 Informational Memorandum No. 57, May 24, 2000.

¹¹⁷ Howard Hogan to John Thompson, U.S. Census Bureau, “Disclosure Avoidance Techniques for Census 2000,” Census 2000 Decision Memorandum No. 102, April 21, 2000; Phil Steel and Laura Zayatz, “The Effects of the Disclosure Limitation Procedure on Census 2000 Tabular Data Products (Abridged),” Census 2000 Evaluation C.1, April 15, 2003.

Appendix A:

Major Events in the Planning and Conduct of Census 2000

October 24, 1991	Decennial Census Improvement Act of 1991 directed the U.S. Secretary of Commerce to hire the National Academy of Sciences to report on ways to conduct the most accurate census possible in 2000 and beyond.
April 1992	Field testing for Census 2000 began with the Simplified Questionnaire Test.
June 9, 1992	U.S. General Accounting Office released its report, "Decennial Census: 1990 Results Show Need for Fundamental Reform."
February 1994	Census Bureau released the "1995 Census Test Design Plan."
October 31, 1994	Census Address List Improvement Act of 1994 modified the Census Bureau's authorizing statute (Title 13, U.S. Code) to allow the agency to share its address list with state, local, and tribal governments and required the U.S. Postal Service to provide address and related information to the Census Bureau for use in constructing and updating its address list.
February 1995	1995 Census Test began.
April 1995	Task Force for Planning the Year 2000 Census released its final report, "Reinventing the Decennial Census."
May 1995	Census Bureau released the preliminary version of its plan for Census 2000, "The Reengineered 2000 Census."
February 28, 1996	Census Bureau formally unveiled "The Plan for Census 2000" at a public ceremony at the U.S. Commerce Department.
March–May 1996	National Content Survey conducted.
June 1996	Race and Ethnic Targeted Test began.
March 21, 1997	Census Bureau awarded the data-capture contract to Lockheed Martin Mission Systems.
March 31, 1997	Census Bureau submitted to Congress the list of subjects proposed for inclusion in Census 2000.
April 25, 1997	Census Bureau awarded the data access and dissemination system contract to IBM.
July 1997	Census Bureau delivered to Congress its comprehensive and detailed plans for Census 2000, "Report to Congress—The Plan for Census 2000" and "Census 2000 Operational Plan."
October 10, 1997	Census Bureau awarded the advertising contract for Census 2000 to Young & Rubicam and a consortium of four partners.
November 26, 1997	The Department of Commerce and Related Agencies Appropriations Act of 1998 established dual-track planning, contained language providing for judicial review of the use of sampling techniques to produce apportionment population counts, and established the Census Monitoring Board.
January 28, 1998	Census Bureau awarded the data capture services contract to TRW.
February 1998	Two lawsuits were filed challenging the use of sampling in completion of nonresponse follow-up and in the Integrated Coverage Measurement program to produce the congressional apportionment counts.
February 1998	Local Update of Census Addresses (LUCA) began.
March 1998	Census 2000 Dress Rehearsal began.

March 30, 1998	Census Bureau submitted to Congress the proposed questions for Census 2000 (7 on the short form and 53 on the long form).
December 1998– May 1999	Contracts for printing Census 2000 questionnaires awarded.
January 25, 1999	Supreme Court ruled, in <i>Department of Commerce v. U.S. House of Representatives</i> (119 S.Ct. 765 (1999)), that the Census Bureau's authorizing statute (Title 13, U.S. Code) prohibited the use of sampling to produce congressional apportionment population counts.
February 23, 1999	Revised plan for Census 2000 released; this plan eliminated sampling for nonresponse follow-up and Integrated Coverage Measurement and incorporated the Accuracy and Coverage Evaluation (A.C.E.) program.
April 1999	First of four data capture centers opened in Baltimore, MD.
January 2000	Census 2000 data collection began in rural Alaska.
April 1, 2000	Census Day.
April–July 2000	Nonresponse follow-up conducted.
May–August 2000	Accuracy and Coverage Evaluation in-person interviews conducted.
December 28, 2000	Secretary of Commerce delivered apportionment counts to the President.
January 6, 2001	President delivered apportionment statement to the Clerk of the U.S. House of Representatives.
March 6, 2001	Secretary of Commerce decided against statistical adjustment of the Census 2000 redistricting data.
March 7–30, 2001	Census Bureau delivered redistricting data to the states.
June 2001	Last of the data capture centers (Baltimore) closed.
June 2001– September 2003	Count question resolution program.
September 1, 2001	Census Monitoring Board sent final reports to Congress.
October 16, 2001	Census Bureau Acting Director decided against adjustment of the Census 2000 data for nonredistricting purposes.
June 2003–April 2004	Release of last printed report series, <i>Summary Population and Housing Unit Counts</i> (PHC-3).

Appendix B:

Census 2000 Regional Census Centers and Local Census Offices by Regional Census Center Code Number

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Boston	Boston	MA	2199	RCC	2/15/1998	3/15/2001
New Britain	New Britain	CT	2112	C	8/2/1999	9/30/2000
Hartford	Hartford	CT	2113	A	10/1/1998	9/30/2000
New Haven	New Haven	CT	2114	A	8/12/1999	9/30/2000
Norwich	Norwich	CT	2115	C	8/6/1999	9/30/2000
Stamford	Stamford	CT	2116	A	11/1/1998	9/30/2000
Waterbury	Waterbury	CT	2117	C	7/1/1999	9/30/2000
Boston	Boston	MA	2118	A	10/1/1998	9/30/2000
Boston South	Allston	MA	2119	A	9/7/1999	9/30/2000
Yarmouth	S. Yarmouth	MA	2121	C	8/20/1999	8/31/2000
Lowell	Lowell	MA	2122	B	10/1/1998	9/30/2000
Cambridge	Cambridge	MA	2123	A	9/1/1999	9/30/2000
New Bedford	New Bedford	MA	2124	B	10/1/1998	9/30/2000
Beverly	Beverly	MA	2125	B	8/4/1999	9/30/2000
Pittsfield	Pittsfield	MA	2126	C	9/1/1999	9/30/2000
Randolph	Randolph	MA	2127	B	9/1/1999	9/30/2000
Springfield	Springfield	MA	2128	C	7/1/1999	9/30/2000
Worcester	Worcester	MA	2130	C	10/1/1998	9/30/2000
Bangor	Bangor	ME	2131	D	8/1/1999	9/30/2000
Portland	South Portland	ME	2132	D	7/1/1999	9/30/2000
Concord	Concord	NH	2133	D	10/1/1998	9/30/2000
Dover	Dover	NH	2134	D	8/1/1999	9/30/2000
Albany	Albany	NY	2135	C	10/1/1998	9/30/2000
Amherst	Amherst	NY	2136	C	8/1/1999	9/30/2000
Buffalo	Buffalo	NY	2137	A	10/1/1998	8/31/2000
Elmira	Elmira	NY	2138	C	7/1/1999	9/30/2000
Glens Falls	Glens Falls	NY	2139	D	7/1/1999	9/30/2000
Kingston	Kingston	NY	2140	C	8/1/1999	8/31/2000
Niagara Falls	Niagara Falls	NY	2142	C	8/1/1999	8/31/2000
Rochester	Rochester	NY	2143	B	7/1/1999	9/30/2000
Syracuse	Syracuse	NY	2144	C	10/1/1998	9/30/2000
Utica	Utica	NY	2145	D	7/1/1999	9/30/2000
Watertown	Watertown	NY	2146	D	7/1/1999	8/31/2000
Providence	Providence	RI	2147	A	8/4/1999	9/30/2000
Warwick	Warwick	RI	2148	C	7/1/1999	9/30/2000
Burlington	Williston	VT	2149	D	8/1/1999	9/30/2000
San Juan North	Hato Rey	PR	2150	E	7/1/1999	9/15/2000
Guaynabo	Guaynabo	PR	2151	E	8/1/1999	9/15/2000
Bayamon	Bayamon	PR	2152	E	7/1/1999	9/15/2000
Arecibo	Arecibo	PR	2153	E	9/1/1999	9/15/2000
Aguadilla	Aguadilla	PR	2154	E	9/1/1999	9/15/2000
Mayaguez	Mayaguez	PR	2155	E	9/1/1999	9/15/2000
Ponce	Ponce	PR	2156	E	8/1/1999	9/15/2000
Caguas	Caguas	PR	2157	E	7/1/1999	9/15/2000
Carolina	Carolina	PR	2158	E	8/1/1999	9/15/2000
Bridgeport	Bridgeport	CT	2159	A	9/1/1999	9/30/2000
Chelsea	Chelsea	MA	2160	A	9/1/1999	9/30/2000
Natick	Natick	MA	2161	B	9/13/1999	9/30/2000
Middletown	Middletown	NY	2162	C	9/1/1999	9/30/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
New York	New York	NY	2299	RCC	12/9/1997	10/31/2000
Bergen Co. North	Glen Rock	NJ	2211	C	7/1/1999	9/8/2000
Bergen Co. South	Hasbrouck Heights	NJ	2212	A	7/1/1999	9/12/2000
Newark	Newark	NJ	2213	A	10/1/1998	9/25/2000
Essex Co. West	Verona	NJ	2214	A	9/1/1999	8/29/2000
Hudson Co. North	Union City	NJ	2215	A	9/1/1999	9/15/2000
Jersey City	Jersey City	NJ	2216	A	10/1/1998	9/12/2000
Middlesex Co.	New Brunswick	NJ	2217	B	8/1/1999	9/28/2000
Sussex Co./Warren Co.	Hackettstown	NJ	2218	C	8/1/1999	8/31/2000
Paterson	Paterson	NJ	2219	A	10/1/1998	9/27/2000
Somerset Co./Union Co.	Plainfield	NJ	2220	C	8/1/1999	9/28/2000
Bronx Northeast	Bronx	NY	2221	A	9/1/1999	9/22/2000
Bronx Northwest	Bronx	NY	2222	A	9/1/1999	8/28/2000
New York—Bronx	New York—Bronx	NY	2223	A	10/1/1998	9/21/2000
Bronx Southwest	Bronx	NY	2224	A	7/1/1999	9/26/2000
Brooklyn Central	Brooklyn Central	NY	2225	A	8/1/1999	9/11/2000
Brooklyn East	Brooklyn	NY	2226	A	7/1/1999	9/15/2000
Brooklyn Northeast	Brooklyn	NY	2227	A	7/1/1999	9/7/2000
Brooklyn	Brooklyn	NY	2228	A	12/1/1998	9/11/2000
Brooklyn	Brooklyn	NY	2229	A	10/1/1998	9/28/2000
Brooklyn Southwest	Brooklyn	NY	2230	A	7/7/1999	9/7/2000
Nassau Co. Northeast	Bethpage	NY	2231	B	8/1/1999	8/28/2000
Garden City	Garden City	NY	2232	B	12/1/1998	9/26/2000
New York East	New York	NY	2233	A	9/15/1999	9/25/2000
New York North	New York	NY	2234	A	9/15/1999	9/14/2000
New York Northeast	New York	NY	2235	A	9/15/1999	9/26/2000
New York Northwest	New York	NY	2236	A	9/1/1999	8/30/2000
New York	New York	NY	2237	A	10/1/1998	9/28/2000
New York West	New York	NY	2238	A	9/1/1999	9/13/2000
Queens Central	Woodhaven	NY	2239	A	9/1/1999	9/29/2000
Queens Northeast	Flushing	NY	2240	A	9/1/1999	9/12/2000
Queens Northwest	Long Island City	NY	2241	A	8/1/1999	9/29/2000
Jamaica	Jamaica	NY	2242	A	10/1/1998	9/14/2000
Queens Southwest	Long Island City	NY	2243	A	9/1/1999	9/29/2000
Richmond Co.	Saint George/Staten	NY	2244	A	8/1/1999	9/13/2000
Rockland Co./Westchester Co. North.....	Orangeburg	NY	2245	B	8/1/1999	9/14/2000
Suffolk Co. East	Medford, LI	NY	2246	C	8/11/1999	9/28/2000
Suffolk Co. West	Hauppauge	NY	2247	C	8/1/1999	9/13/2000
White Plains	White Plains	NY	2248	B	10/1/1998	9/28/2000
Morris County	Dover	NJ	2249	C	9/1/1999	9/11/2000
Philadelphia	Philadelphia	PA	2399	RCC	2/15/1998	2/19/2001
Washington	Washington	DC	2311	A	9/15/1998	9/14/2000
DC West	Washington	DC	2312	A	11/1/1999	9/15/2000
New Castle	New Castle	DE	2313	C	10/1/1998	9/30/2000
Annapolis	Annapolis	MD	2314	C	7/1/1999	9/26/2000
Baltimore East	Baltimore	MD	2315	A	9/1/1999	9/15/2000
Baltimore	Baltimore	MD	2316	A	11/4/1998	9/30/2000
Hagerstown	Hagerstown	MD	2317	C	7/1/1999	9/30/2000
Rockville	Rockville	MD	2318	C	10/1/1998	9/30/2000
Forestville	Forestville	MD	2319	C	9/20/1999	9/15/2000
Waldorf	Waldorf	MD	2320	C	7/1/1999	9/15/2000
Towson	Towson	MD	2321	C	7/1/1999	9/15/2000
Camden	Camden	NJ	2322	A	10/1/1998	9/29/2000
Freehold	Freehold	NJ	2324	C	7/1/1999	9/30/2000
Trenton	Trenton	NJ	2325	C	10/1/1998	9/30/2000
Vineland	Vineland	NJ	2326	C	7/1/1999	9/30/2000
Allentown	Allentown	PA	2327	C	8/1/1999	9/30/2000
Altoona	Altoona	PA	2328	C	7/1/1999	9/30/2000
Rochester	Rochester	PA	2329	C	8/1/1999	9/30/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Philadelphia—Con.						
Coatesville	Coatesville	PA	2330	C	8/1/1999	9/30/2000
Erie	Erie	PA	2331	C	7/1/1999	9/30/2000
Harrisburg	Harrisburg	PA	2332	C	10/1/1998	9/30/2000
Johnstown	Johnstown	PA	2333	C	7/12/1999	9/30/2000
Langhorne	Langhorne	PA	2334	C	8/1/1999	9/30/2000
McKeesport	McKeesport	PA	2335	C	8/1/1999	9/30/2000
Concordville	Concordville	PA	2336	B	8/3/1999	9/15/2000
Norristown	Norristown	PA	2337	C	10/1/1998	9/30/2000
Philadelphia	Philadelphia	PA	2338	A	10/1/1998	9/15/2000
Philadelphia Frankford	Philadelphia	PA	2339	A	9/10/1999	9/30/2000
Philadelphia West	Philadelphia	PA	2340	A	9/1/1999	9/30/2000
Pittsburgh	Pittsburgh	PA	2341	A	10/1/1998	9/15/2000
Reading	Reading	PA	2342	C	7/1/1999	9/27/2000
Scranton	Scranton	PA	2343	C	9/1/1999	9/28/2000
State College	State College	PA	2344	C	10/1/1998	9/15/2000
Wilkes-Barre	Wilkes-Barre	PA	2346	C	10/1/1998	9/28/2000
York	York	PA	2347	C	7/1/1999	9/25/2000
College Park	Riverdale	MD	2348	B	9/1/1999	9/28/2000
Woodlawn	Woodlawn	MD	2349	C	9/1/1999	9/26/2000
Cherry Hill	Cherry Hill	NJ	2350	C	9/1/1999	9/30/2000
Lakehurst	Lakehurst (Ocean City)	NJ	2351	C	9/1/1999	9/15/2000
Greensburg	Greensburg	PA	2352	C	8/1/1999	9/28/2000
Philadelphia North	Philadelphia	PA	2353	A	9/1/1999	9/27/2000
Washington	Washington	PA	2354	C	9/1/1999	9/29/2000
Detroit	Detroit	MI	2499	RCC	2/15/1998	3/25/2001
Ann Arbor	Ann Arbor	MI	2411	C	8/4/1999	9/26/2000
Battle Creek	Battle Creek	MI	2412	C	7/1/1999	9/28/2000
Dearborn	Dearborn	MI	2413	B	6/28/1999	9/28/2000
Detroit	Detroit	MI	2414	A	10/1/1998	9/27/2000
Detroit West	Detroit	MI	2415	A	8/3/1999	9/19/2000
Flint	Flint	MI	2416	C	8/6/1999	9/22/2000
Grand Rapids	Grand Rapids	MI	2417	C	10/1/1998	9/29/2000
Kalamazoo	Kalamazoo	MI	2418	C	7/7/1999	9/27/2000
Lansing	Lansing	MI	2419	C	9/24/1998	9/26/2000
Livonia	Livonia	MI	2420	B	7/1/1999	9/28/2000
Macomb Co.	Sterling Heights	MI	2421	C	8/17/1999	9/20/2000
Marquette	Ishpeming	MI	2422	C	7/13/1999	9/27/2000
Midland	Midland	MI	2423	C	8/2/1999	9/25/2000
Muskegon	Muskegon	MI	2424	C	9/14/1999	9/29/2000
Saginaw	Saginaw	MI	2425	C	8/2/1999	9/25/2000
Clawson	Clawson	MI	2426	C	9/28/1998	9/26/2000
Akron	Akron	OH	2427	C	9/9/1999	9/26/2000
Bowling Green	Bowling Green	OH	2428	C	9/1/1999	9/29/2000
Canton	Canton	OH	2429	C	9/29/1998	9/27/2000
Chillicothe	Chillicothe	OH	2430	C	7/1/1999	9/22/2000
Cincinnati	Cincinnati	OH	2431	A	10/5/1998	9/29/2000
Blue Ash	Blue Ash	OH	2432	C	9/15/1999	9/29/2000
Cleveland	Cleveland	OH	2433	A	7/1/1999	9/28/2000
Richmond Heights	Richmond Heights	OH	2434	A	10/1/1998	9/26/2000
Cleveland Southeast	North Randall	OH	2435	C	9/1/1999	9/25/2000
Columbus	Columbus	OH	2436	C	11/1/1998	9/28/2000
Columbus West	Columbus	OH	2437	C	10/1/1999	9/28/2000
Dayton	Dayton	OH	2438	C	8/1/1999	9/21/2000
Hamilton	Cincinnati	OH	2439	C	9/1/1999	9/19/2000
Lorain	Lorain	OH	2440	C	7/14/1999	9/27/2000
Mansfield	Mansfield	OH	2441	C	7/1/1999	9/28/2000
Newark	Newark	OH	2442	C	8/1/1999	9/27/2000
Springfield	Springfield	OH	2443	C	6/30/1999	9/22/2000
Toledo	Toledo	OH	2444	C	9/29/1998	9/29/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Detroit—Con.						
Youngstown	Youngstown	OH	2445	C	7/1/2000	9/26/2000
Beaver	Beaver	WV	2446	C	9/1/1999	9/22/2000
Charleston	Charleston	WV	2447	C	10/1/1998	9/21/2000
Westover	Westover	WV	2448	C	9/1/1999	9/26/2000
Detroit North	Highland Park	MI	2449	A	9/17/1999	9/29/2000
Traverse City	Traverse City	MI	2450	C	9/1/1999	9/22/2000
Steubenville	Steubenville	OH	2451	C	8/25/1999	9/29/2000
Parkersburg	Parkersburg	WV	2452	C	8/5/1999	9/25/2000
Chicago	Chicago	IL	2599	RCC	1/20/1998	12/14/2000
Belleville	Belleville	IL	2511	C	10/1/1998	9/13/2000
Chicago Far North	Chicago	IL	2512	A	9/23/1999	9/27/2000
Chicago Far South	Chicago	IL	2513	A	9/17/1999	9/26/1999
Chicago Far Southwest	Chicago	IL	2514	A	10/27/1999	10/12/2000
Chicago Near North	Chicago	IL	2515	A	10/5/1999	10/13/2000
Cook Co. West	Lemont	IL	2516	B	8/18/1999	9/29/2000
Chicago	Chicago	IL	2517	A	10/2/1998	10/13/2000
Chicago Near Southwest	Chicago	IL	2518	A	9/15/1999	9/26/2000
Chicago Northwest	Chicago	IL	2519	A	9/2/1999	9/27/2000
Chicago	Chicago	IL	2520	A	10/1/1998	10/11/2000
Des Plaines	Des Plaines	IL	2521	B	9/28/1998	9/11/2000
Cook Co. Southwest	Hazelcrest	IL	2522	B	8/16/1999	9/15/2000
Glen Ellyn	Glen Ellyn	IL	2523	C	10/1/1998	9/12/2000
Elgin	Elgin	IL	2524	C	8/1/1999	9/26/2000
Tinley Park	Tinley Park	IL	2525	C	7/1/1999	9/27/2000
Lake Co.	Vernon Hills	IL	2526	B	10/8/1999	9/29/2000
Marion	Marion	IL	2527	C	7/1/1999	9/27/2000
Quincy	Quincy	IL	2528	C	9/15/1999	9/28/2000
Peoria	Peoria	IL	2529	C	7/9/1999	9/11/2000
Rockford	Rockford	IL	2530	C	7/7/1999	9/28/2000
Springfield	Springfield	IL	2531	C	10/1/1998	9/13/2000
Champaign	Champaign	IL	2532	C	7/1/1999	9/25/2000
Evansville	Evansville	IN	2533	C	8/2/1999	9/11/2000
Fort Wayne	Fort Wayne	IN	2534	C	7/6/1999	9/29/2000
Gary	Gary	IN	2535	C	10/1/1998	9/14/2000
Indianapolis	Indianapolis	IN	2536	A	10/1/1998	9/25/2000
Kokomo	Kokomo	IN	2537	C	8/27/1999	9/27/2000
Marion Co.	Indianapolis	IN	2538	B	9/1/1999	9/26/2000
Muncie	Muncie	IN	2539	C	10/1/1998	9/25/2000
Clarksville	Clarksville	IN	2540	C	9/1/1999	9/26/2000
South Bend	South Bend	IN	2541	C	9/1/1999	9/28/2000
Terre Haute	Terre Haute	IN	2542	C	8/2/1999	9/26/2000
Germantown	Germantown	WI	2543	C	7/1/1999	9/13/2000
Fond Du Lac	Fond Du Lac	WI	2544	C	7/1/1999	9/13/2000
Green Bay	Green Bay	WI	2545	C	8/1/1999	9/27/2000
Racine	Racine	WI	2546	C	9/18/1999	9/28/2000
La Crosse	La Crosse	WI	2547	C	11/5/1998	9/28/2000
Madison	Madison	WI	2548	C	10/1/1998	9/12/2000
Milwaukee	Milwaukee	WI	2549	A	10/1/1998	9/28/2000
Superior	Superior	WI	2550	C	7/1/1999	9/14/2000
West Allis	Muskego	WI	2551	B	9/1/1999	9/14/2000
Bloomington	Bloomington	IL	2552	C	9/1/1999	9/11/2000
Cook County Northwest	Palatine	IL	2553	B	9/1/1999	9/13/2000
Stevens Point	Stevens Point	WI	2554	C	8/2/1999	9/13/2000
Chicago Central	Chicago	IL	2555	A	8/2/1999	9/27/2000
Kansas City	Kansas City	KS	2699	RCC	12/22/1997	12/14/2000
Ft. Smith	Ft. Smith	AR	2611	C	8/1/1999	9/30/2000
Jonesboro	Jonesboro	AR	2612	C	7/1/1999	9/30/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Kansas City—Con.						
Little Rock	Little Rock	AR	2613	C	10/1/1998	9/30/2000
Pine Bluff	Pine Bluff	AR	2614	C	7/1/1999	9/30/2000
Ames	Ames	IA	2615	C	7/1/1999	9/15/2000
Cedar Rapids	Cedar Rapids	IA	2616	C	7/1/1999	9/15/2000
Des Moines	Des Moines	IA	2617	C	10/1/1998	9/30/2000
Sioux City	Sioux City	IA	2618	C	9/1/1999	9/15/2000
Waterloo	Waterloo	IA	2619	C	8/1/1999	9/15/2000
Hays	Hays	KS	2620	C	8/1/1999	9/30/2000
Kansas City	Kansas City	KS	2621	C	10/1/1998	9/30/2000
Topeka	Topeka	KS	2622	C	8/1/1999	9/30/2000
Wichita	Wichita	KS	2623	C	8/1/1999	9/30/2000
Coon Rapids	Maple Grove	MN	2624	C	8/1/1999	9/30/2000
Duluth	Duluth	MN	2625	C	9/1/1999	9/15/2000
Minneapolis	Minneapolis	MN	2626	A	10/1/1998	9/30/2000
Minneapolis West	Edina	MN	2627	B	8/1/1999	9/30/2000
Moorhead	Moorhead	MN	2628	C	7/1/1999	9/30/2000
Rochester	Rochester	MN	2629	C	9/1/1999	9/15/2000
Shakopee	Shakopee	MN	2630	C	7/1/1999	9/15/2000
St. Paul	St. Paul	MN	2631	B	10/1/1998	9/30/2000
Blue Springs	Blue Springs	MO	2632	C	9/1/1999	9/30/2000
Cape Girardeau	Cape Girardeau	MO	2633	C	7/1/1999	9/15/2000
Columbia	Columbia	MO	2634	C	7/1/1999	9/30/2000
Kansas City	Kansas City	MO	2635	A	10/1/1998	9/15/2000
Springfield	Springfield	MO	2636	C	7/1/1999	9/30/2000
St. Joseph	St. Joseph	MO	2637	C	8/1/1999	9/30/2000
St. Louis	St. Louis	MO	2638	A	10/1/1998	9/30/2000
St. Louis County North	St. Louis County North	MO	2639	C	9/1/1999	9/30/2000
St. Louis County South	St. Louis County South	MO	2640	C	9/1/1999	9/30/2000
Duncan	Duncan	OK	2641	C	9/1/1999	9/15/2000
Enid	Enid	OK	2642	C	7/1/1999	9/15/2000
Tahlequah	Tahlequah	OK	2643	C	7/1/1999	9/15/2000
Oklahoma City	Oklahoma City	OK	2644	C	10/1/1998	9/30/2000
Shawnee	Shawnee	OK	2645	C	7/1/1999	9/15/2000
Tulsa	Tulsa	OK	2646	C	10/1/1998	9/30/2000
Seattle	Seattle	WA	2799	RCC	12/15/1997	12/31/2001
Anchorage	Anchorage	AK	2711	D	10/1/1998	10/15/2000
Castro Valley	Pleasanton	CA	2712	C	10/1/1999	9/30/2000
Concord	Concord	CA	2713	C	7/1/1999	9/30/2000
Davis	Davis	CA	2714	C	7/1/1999	9/15/2000
Eureka	Eureka	CA	2715	D	7/1/1999	9/15/2000
Los Gatos	Sunnyvale	CA	2716	C	9/1/1999	10/15/2000
Modesto	Modesto	CA	2717	C	10/1/1998	9/30/2000
Oakland	Oakland	CA	2718	A	10/1/1998	10/15/2000
Placerville	Placerville	CA	2719	D	8/1/1999	9/30/2000
Redding	Redding	CA	2720	D	7/1/1999	9/30/2000
Sacramento	Sacramento	CA	2721	B	10/1/1998	10/15/2000
Sacramento South	Sacramento	CA	2722	C	8/1/1999	9/30/2000
San Bruno	So. San Francisco	CA	2723	C	8/24/1999	9/30/2000
San Francisco	San Francisco	CA	2724	A	10/1/1998	10/15/2000
San Francisco West	San Francisco West	CA	2725	A	10/1/1999	9/15/2000
San Jose	San Jose	CA	2726	A	10/1/1998	9/30/2000
San Leandro	Oakland	CA	2727	A	9/1/1999	9/30/2000
Santa Rosa	Santa Rosa	CA	2728	C	10/1/1998	9/30/2000
Sunnyvale	Sunnyvale	CA	2729	C	7/1/1999	9/15/2000
Lewiston	Lewiston	ID	2730	D	9/28/1999	9/30/2000
Boise	Boise	ID	2731	D	7/6/1999	9/30/2000
Beaverton	Beaverton	OR	2732	C	8/1/1999	9/15/2000
Bend	Redmond	OR	2733	D	7/1/1999	9/30/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Seattle—Con.						
Eugene	Eugene	OR	2734	C	8/1/1999	10/15/2000
Portland	Portland	OR	2735	C	10/1/1998	9/30/2000
Salem	Salem	OR	2736	C	8/1/1999	9/15/2000
Bellevue	Bellevue	WA	2737	C	9/1/1999	9/30/1999
Everett	Everett	WA	2738	C	8/1/1999	9/15/2000
Tukwila	Tukwila	WA	2739	B	8/1/1999	9/30/2000
Olympia	Olympia	WA	2740	C	8/27/1999	9/30/2000
Richland	Richland	WA	2741	D	7/1/1999	9/15/2000
Seattle	Seattle	WA	2742	B	10/1/1998	9/30/2000
Silverdale	Silverdale	WA	2743	C	7/1/1999	9/30/2000
Spokane	Spokane	WA	2744	C	10/1/1998	10/15/2000
Tacoma	Tacoma	WA	2745	C	10/1/1998	10/15/2000
San Francisco NE	San Francisco Northeast	CA	2746	A	9/1/1999	10/15/2000
Idaho Falls	Idaho Falls	ID	2749	D	9/1/1999	9/30/2000
Mt. Vernon	Mount Vernon	WA	2750	C	8/1/1999	9/30/2000
Charlotte	Charlotte	NC	2899	RCC	1/26/1998	1/12/2002
Corbin	Corbin	KY	2811	C	7/1/1999	9/15/2000
Covington	Covington	KY	2812	C	9/22/2000	9/30/2000
Hopkinsville	Hopkinsville	KY	2814	C	7/6/1999	9/30/2000
Lexington	Lexington	KY	2815	C	9/8/1999	9/15/2000
Louisville	Louisville	KY	2816	B	10/1/1998	9/15/2000
Asheville	Asheville	NC	2817	C	8/9/1999	9/30/2000
Charlotte	Charlotte	NC	2818	C	12/1/1998	9/30/2000
Durham	Durham	NC	2819	C	12/1/1998	9/30/2000
Hickory	Hickory	NC	2820	C	9/7/1999	9/30/2000
Greensboro	Greensboro	NC	2821	C	10/6/1998	9/15/2000
Greenville East	Greenville	NC	2822	C	7/7/1999	9/30/2000
Monroe	Monroe	NC	2823	C	7/8/1999	9/30/2000
Raleigh	Raleigh	NC	2824	C	9/1/1999	9/30/2000
Greenville West	Greenville	NC	2825	C	9/1/1999	9/30/2000
Wilmington	Wilmington	NC	2827	C	7/27/1999	9/15/2000
Winston-Salem	Winston-Salem	NC	2828	C	7/15/1999	9/30/2000
Anderson	Anderson	SC	2829	C	9/13/1999	9/15/2000
Beaufort	Beaufort	SC	2830	C	11/2/1999	9/30/2000
Charleston	Charleston	SC	2831	C	9/13/1999	9/30/2000
Columbia	Columbia	SC	2832	C	10/1/1998	9/30/2000
Rock Hill	Rock Hill	SC	2833	C	10/1/1999	9/20/2000
Chattanooga	Chattanooga	TN	2835	C	7/1/1999	9/15/2000
Clarksville	Clarksville	TN	2836	C	9/9/1999	9/30/2000
Jackson	Jackson	TN	2837	C	8/16/1999	9/30/2000
Johnson City	Johnson City	TN	2838	C	7/1/1999	9/30/2000
Knoxville	Knoxville	TN	2839	C	7/1/1999	9/30/2000
Memphis	Memphis	TN	2840	A	10/2/1998	9/30/2000
Murfreesboro	Murfreesboro	TN	2841	C	10/1/1999	9/30/2000
Nashville	Nashville	TN	2842	C	10/1/1998	9/15/2000
Tullahoma	Tullahoma	TN	2843	C	7/1/1999	9/15/2000
Alexandria	Alexandria	VA	2844	B	10/1/1998	9/15/2000
Ashland	Ashland	VA	2845	C	8/16/1999	9/15/2000
Charlottesville	Charlottesville	VA	2846	C	8/1/1999	9/30/2000
Chesapeake	Chesapeake	VA	2847	C	9/1/1999	9/15/2000
Fairfax	Alexandria	VA	2848	B	8/2/1999	9/15/2000
Manassas	Manassas	VA	2849	C	8/6/1999	9/30/2000
Newport News	Newport News	VA	2850	C	9/1/1999	9/15/2000
Radford	Radford	VA	2851	C	9/1/1999	9/30/2000
Richmond	Richmond	VA	2852	A	10/1/1998	9/15/2000
Roanoke	Roanoke	VA	2853	C	8/1/1999	9/15/2000
Virginia Beach	Virginia Beach	VA	2854	C	10/1/1998	9/15/2000
Ashland	Ashland	KY	2855	C	9/10/1999	9/15/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Charolette—Con.						
Bowling Green	Bowling Green	KY	2856	C	9/1/1999	9/30/2000
Gastonia	Gastonia	NC	2858	C	9/2/1999	9/30/2000
Salisbury	Salisbury	NC	2859	C	9/1/1999	9/30/2000
Conway	Conway	SC	2860	C	9/21/1999	9/30/2000
Florence	Florence	SC	2861	C	9/3/1999	9/30/2000
Greenville	Greenville	SC	2862	C	9/1/1999	9/15/2000
Crossville	Crossville	TN	2864	C	9/8/1999	9/15/2000
Frederickburg	Fredericksburg	VA	2865	C	9/2/1999	9/15/2000
Atlanta	Atlanta	GA	2999	RCC	1/22/1998	1/21/2001
Birmingham	Birmingham	AL	2911	A	10/1/1998	9/15/2000
Gadsden	Gadsden	AL	2912	C	7/1/1999	9/30/2000
Huntsville	Huntsville	AL	2913	C	7/1/1999	9/30/2000
Mobile	Mobile	AL	2914	C	7/14/1999	9/30/2000
Montgomery	Montgomery	AL	2915	C	10/1/1998	9/15/2000
Opelika	Opelika	AL	2916	C	7/1/1999	10/15/2000
Tuscaloosa	Tuscaloosa	AL	2917	C	7/1/1999	10/15/2000
Delray Beach	Delray Beach	FL	2918	B	8/1/1999	10/15/2000
Bradenton	Bradenton	FL	2919	C	7/1/1999	9/30/2000
Broward Co. South	Pembroke Pines	FL	2920	C	10/1/1999	9/15/2000
Miami-Dade NE	Miami Beach	FL	2921	A	9/1/1999	10/31/2000
Homestead	Homestead	FL	2922	C	9/1/1999	9/15/2000
Daytona Beach	Daytona Beach	FL	2923	C	8/1/1999	10/15/2000
Ft. Lauderdale	Ft. Lauderdale	FL	2924	A	10/8/1998	10/15/2000
Ft. Myers	Ft. Myers	FL	2925	C	10/1/1998	9/30/2000
Ft. Pierce	Ft. Pierce	FL	2926	C	7/1/1999	10/15/2000
Gainesville	Gainesville	FL	2927	C	7/7/1999	10/15/2000
Hialeah	Hialeah	FL	2928	B	7/1/1999	10/31/2000
Hillsborough Co.	Tampa	FL	2929	B	7/1/1999	10/15/2000
Jacksonville North	Jacksonville	FL	2930	C	9/1/1999	10/15/2000
Jacksonville	Jacksonville	FL	2931	C	10/1/1998	10/15/2000
Lakeland	Lakeland	FL	2932	C	8/1/1999	9/30/2000
West-Melbourne	West-Melbourne	FL	2933	C	10/1/1998	9/30/2000
Miami	Miami	FL	2934	A	10/1/1998	10/31/2000
Miami Springs	Miami Springs	FL	2935	A	10/1/1998	10/31/2000
Ocala	Ocala	FL	2936	C	8/1/1999	10/31/2000
Orlando	Orlando	FL	2937	C	10/1/1998	10/15/2000
Lake Worth	Lake Worth	FL	2938	C	8/1/1999	9/30/2000
Pensacola	Pensacola	FL	2939	C	10/1/1998	9/30/2000
Palm Harbor	Palm Harbor	FL	2940	C	8/1/1999	10/15/2000
Clearwater	Clearwater	FL	2941	B	7/1/1999	10/15/2000
Sanford	Sanford	FL	2942	C	7/1/1999	9/30/2000
Port Charlotte	Port Charlotte	FL	2943	C	9/1/1999	10/15/2000
Tallahassee	Tallahassee	FL	2944	C	10/1/1998	10/15/2000
Tampa	Tampa	FL	2945	A	10/1/1998	10/15/2000
Albany	Albany	GA	2946	C	9/7/1999	9/30/2000
Atlanta East	Atlanta	GA	2947	A	10/1/1998	9/30/2000
Atlanta West	Atlanta	GA	2948	A	9/15/1999	10/31/2000
Augusta	Augusta	GA	2949	C	9/1/1999	9/30/2000
Decatur	Decatur	GA	2950	B	9/2/1999	9/30/2000
Newnan	Newnan	GA	2951	C	9/1/1999	9/30/2000
Gainesville	Gainesville	GA	2952	C	9/1/1999	9/30/2000
Forest Park	Forest Park	GA	2953	A	9/1/1999	9/30/2000
Duluth	Duluth	GA	2954	B	9/1/1999	9/30/2000
Macon	Macon	GA	2955	C	10/1/1998	9/30/2000
Marietta	Marietta	GA	2956	B	10/1/1998	10/15/2000
Dalton	Dalton	GA	2957	C	8/3/1999	10/15/2000
Savannah	Savannah	GA	2958	C	10/1/1999	9/15/2000
Bessemer	Bessemer	AL	2959	C	8/6/1999	10/15/2000
Florence	Florence	AL	2960	C	8/1/1999	10/15/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Atlanta—Con.						
Brooksville	Brooksville	FL	2961	C	9/7/1999	10/15/2000
Broward County North	Sunrise	FL	2962	B	7/20/1999	10/15/2000
Athens	Bogart	GA	2963	C	8/1/1999	10/15/2000
Columbus	Columbus	GA	2964	C	10/1/1999	9/30/2000
Waycross	Waycross	GA	2965	C	9/1/1999	10/31/2000
Dallas	Dallas	TX	3099	RCC	3/15/1998	4/5/2001
Baton Rouge	Baton Rouge	LA	3011	C	9/3/1999	9/29/2000
Hammond	Hammond	LA	3012	C	10/19/1999	9/28/2000
Houma	Houma	LA	3013	C	9/1/1999	9/26/2000
Opelousas	Opelousas	LA	3014	C	10/1/1998	9/29/2000
Harahan	Harahan	LA	3015	A	8/1/1999	9/28/2000
Monroe	Monroe	LA	3016	C	7/7/1999	9/6/2000
New Orleans	New Orleans	LA	3017	A	10/1/1998	9/25/2000
Harris Co. NW	New Orleans	LA	3018	C	9/1/2000	9/30/2000
Shreveport	Shreveport	LA	3019	C	7/1/1999	9/13/2000
Biloxi/Gulfport	Gulfport	MS	3020	C	8/17/1999	9/27/2000
Greenville	Greenville	MS	3021	C	8/6/1999	9/25/2000
Jackson	Jackson	MS	3022	C	10/1/1998	9/21/2000
Meridian	Meridian	MS	3023	C	9/1/1999	9/26/2000
Tupelo	Tupelo	MS	3024	C	7/6/1999	9/21/2000
Abilene	Abilene	TX	3025	C	7/6/1999	9/28/2000
Amarillo	Amarillo	TX	3026	C	7/7/1999	9/30/2000
Austin	Austin	TX	3027	C	7/1/1999	9/29/2000
Beaumont	Beaumont	TX	3028	C	7/1/1999	9/13/2000
Bedford	Bedford/Eules	TX	3029	B	9/1/1999	9/11/2000
College Station	College Station	TX	3030	C	7/8/1999	9/28/2000
Corpus Christi	Corpus Christi	TX	3031	C	10/1/1998	9/15/2000
Dallas	Dallas	TX	3032	A	10/1/1998	9/14/2000
Dallas County NE	Dallas	TX	3033	C	7/1/1999	9/13/2000
Dallas Co. NW	Farmers Branch	TX	3034	B	9/15/1999	9/13/2000
Dallas Co. South	Duncanville	TX	3035	C	9/7/1999	9/15/2000
El Paso	El Paso	TX	3036	D	7/23/1999	9/7/2000
Fort Worth	Fort Worth	TX	3037	C	10/1/1998	9/19/2000
Houston	Houston	TX	3038	C	10/1/1998	9/26/2000
Harris Co. NW	Houston	TX	3039	C	9/8/1999	9/29/2000
Harris Co. South	Harris Co. South	TX	3040	B	7/1/1999	9/28/2000
Houston	Houston	TX	3041	A	10/1/1998	9/25/2000
Huntsville	Huntsville	TX	3042	C	8/3/1999	9/28/2000
Laredo	Laredo	TX	3043	C	7/16/1999	9/7/2000
Longview	Longview	TX	3044	C	8/24/1999	9/29/2000
Lubbock	Lubbock	TX	3045	C	10/1/1998	9/22/2000
McAllen	McAllen	TX	3046	C	7/9/1999	9/14/2000
Stafford	Stafford	TX	3047	C	8/2/1999	9/29/2000
Plano	Plano	TX	3048	C	11/2/1998	9/21/2000
San Antonio	San Antonio	TX	3049	B	10/1/1998	9/15/2000
San Antonio East	San Antonio East	TX	3050	C	8/2/1999	9/15/2000
San Antonio North	San Antonio	TX	3051	C	8/1/1999	9/15/2000
Sherman	Sherman	TX	3052	C	9/1/1999	9/27/2000
Texas City	Texas City	TX	3053	C	7/1/1999	9/14/2000
Tyler	Tyler	TX	3054	C	10/1/1999	9/29/2000
Victoria	Victoria	TX	3055	C	10/4/1999	9/14/2000
Waco	Waco	TX	3056	C	11/1/1998	9/26/2000
Denver	Denver	CO	3199	RCC	1/28/1998	1/27/2001
Flagstaff	Flagstaff	AZ	3111	D	11/1/1999	9/30/2000
Phoenix	Phoenix	AZ	3112	D	10/19/1998	9/30/2000
Mesa	Chandler	AZ	3113	C	7/1/1999	9/30/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Denver—Con.						
Phoenix	Phoenix	AZ	3114	A	10/1/1998	8/31/2000
Scottsdale	Phoenix	AZ	3115	D	7/1/1999	9/30/2000
Tucson (rural)	Tucson	AZ	3116	D	8/1/1999	9/30/2000
Tucson (urban)	Tucson	AZ	3117	C	8/4/1999	9/30/2000
Window Rock	Window Rock	AZ	3118	D	9/7/1999	9/30/2000
Aurora	Aurora	CO	3119	C	7/1/1999	9/30/2000
Colorado Springs	Colorado Springs	CO	3120	C	7/1/1999	9/30/2000
Denver	Denver	CO	3121	C	10/1/1998	9/30/2000
Grand Junction	Grand Junction	CO	3122	C	9/1/1999	9/30/2000
Greeley	Greeley	CO	3123	C	10/1/1998	9/30/2000
Pueblo	Pueblo	CO	3124	C	9/1/1999	9/30/2000
Westminster	Arvada	CO	3125	C	8/3/1999	9/30/2000
Billings	Billings	MT	3126	D	7/16/1999	9/30/2000
Missoula	Missoula	MT	3127	C	8/5/1999	9/30/2000
Lincoln	Lincoln	NE	3128	C	9/1/1999	9/30/2000
North Platte	North Platte	NE	3129	D	7/28/1999	9/30/2000
Omaha	Omaha	NE	3130	C	10/1/1998	9/30/2000
Henderson	Henderson	NV	3131	C	8/3/1999	9/30/2000
Las Vegas	Las Vegas	NV	3132	A	10/1/1998	9/30/2000
Reno	Reno	NV	3133	D	7/29/1999	9/30/2000
Albuquerque	Albuquerque	NM	3134	C	10/1/1998	9/30/2000
Las Cruces	Las Cruces	NM	3135	D	8/1/1999	9/30/2000
Santa Fe	Santa Fe	NM	3136	D	8/3/1999	9/30/2000
Bismarck	Bismarck	ND	3137	D	8/2/1999	9/30/2000
Fargo	Fargo	ND	3138	C	8/1/1999	9/30/2000
Rapid City	Rapid City	SD	3139	D	7/2/1999	9/30/2000
Sioux Falls	Sioux Falls	SD	3140	C	8/1/1999	9/30/2000
Ogden	Ogden	UT	3141	D	8/23/1999	9/30/2000
Provo	American Fork	UT	3142	D	7/1/1999	9/30/2000
Salt Lake City	Salt Lake City	UT	3143	C	10/1/1998	9/30/2000
Cheyenne	Cheyenne	WY	3144	D	7/8/1999	9/30/2000
Yuma	Yuma	AZ	3145	D	9/9/1999	9/30/2000
Great Falls	Great Falls	MT	3146	D	9/3/1999	9/30/2000
North Las Vegas	North Las Vegas	NV	3147	D	9/1/1999	9/30/2000
Casper	Casper	WY	3148	D	9/1/1999	9/30/2000
Los Angeles	Los Angeles	CA	3299	RCC	3/1/1998	3/17/2001
Fullerton	Fullerton	CA	3211	B	7/21/1999	9/12/2000
Bakersfield	Bakersfield	CA	3212	D	8/16/1999	9/5/2000
Commerce	Commerce	CA	3213	A	8/1/1999	9/12/2000
Glendale	Glendale	CA	3214	B	12/20/1999	9/14/2000
Compton	Compton	CA	3215	A	10/1/1998	9/14/2000
West Covina	West Covina	CA	3216	C	9/1/2000	9/13/2000
East LA/Monterey Park	Monterey Park	CA	3217	A	7/1/2000	9/12/2000
Spring Valley	Spring Valley	CA	3218	C	8/16/1999	9/13/2000
Escondido	Escondido	CA	3219	C	7/1/1999	9/13/2000
Fresno	Fresno	CA	3220	C	10/1/1998	9/1/2000
Hollywood/Mid-Wilshire	Los Angeles	CA	3221	A	7/1/1999	9/13/2000
Garden Grove	Garden Grove	CA	3222	B	7/1/1999	9/15/2000
Inglewood	Inglewood	CA	3223	A	8/2/1999	9/6/2000
Irvine	Irvine	CA	3224	C	7/1/1999	9/15/2000
Long Beach	Long Beach	CA	3225	B	10/1/1998	9/7/2000
Los Angeles	Los Angeles	CA	3226	A	10/1/1998	9/11/2000
Culver City East	Culver City	CA	3227	A	9/1/1999	9/15/2000
Salinas	Salinas	CA	3228	C	8/1/1999	9/7/2000
Vista	Vista	CA	3229	C	9/1/1999	9/14/2000
Chino	Chino	CA	3230	C	8/1/1999	9/8/2000
Palm Springs	Palm Springs	CA	3231	D	7/1/1999	9/13/2000
Victorville	Victorville	CA	3232	D	8/1/1999	9/14/2000

See footnote at end of table.

Name	City	State	Code number	Type of office ¹	Opening date	Closing date
Los Angeles—Con.						
Riverside	Riverside	CA	3233	C	10/1/1998	9/6/2000
San Bernardino	San Bernardino	CA	3234	A	10/1/1998	9/12/2000
San Diego	San Diego	CA	3235	B	10/1/1998	9/12/2000
Chula Vista	Chula Vista	CA	3236	A	10/1/1999	9/6/2000
Santa Ana	Santa Ana	CA	3237	A	10/1/1998	9/15/2000
Santa Clarita	Santa Clarita	CA	3238	C	8/1/1999	9/12/2000
Santa Maria	Santa Maria	CA	3239	C	10/1/1998	9/15/2000
Santa Monica	Los Angeles	CA	3240	B	9/16/1999	9/11/2000
Torrance	Torrance	CA	3241	C	9/1/1999	9/14/2000
Van Nuys	Van Nuys	CA	3242	A	10/1/1998	9/14/2000
Ventura	Ventura	CA	3243	C	7/1/1999	9/11/2000
Hanford	Hanford	CA	3244	C	9/1/1999	9/8/2000
Woodland Hills	Woodland Hills	CA	3245	B	9/1/1999	9/15/2000
Norwalk	Norwalk	CA	3246	B	8/1/1999	9/14/2000
Honolulu	Honolulu	HI	3247	C	10/1/1998	9/22/2000
Kailua	Kailua	HI	3248	D	7/1/1999	9/8/2000
Culver City	Culver City	CA	3249	B	9/1/1999	9/15/2000
Merced	Merced	CA	3250	D	10/4/1999	9/6/2000
Monrovia	Monrovia	CA	3251	C	9/1/1999	9/12/2000

¹For Census 2000, there were six different types of Local Census Offices (LCOs):

Type A: Located in inner-city urban areas that were among the most difficult to enumerate, these LCOs were responsible for enumerating between 121,000 and 285,000 housing units (HUs), and took the census mainly by mailout/mailback (though small areas were enumerated using urban update/leave).

Type B: Type B LCOs were situated in urban metropolitan areas, included some hard to enumerate areas, were responsible for enumerating between 300,000 and 335,000 HUs, and were generally enumerated by mailout/mailback, though some portions relied on the urban update/leave method.

Type C: Found in small cities, towns, and rural areas, these LCOs were less hard to enumerate than Types A and B above, contained between 316,000 and 325,000 HUs, and were enumerated largely by mailout/mailback and update/leave, with some areas using the update/enumerate method.

Type D: Type D LCOs were located in more remote, rural areas; update/leave and list/enumerate were the main methods of data collection, though some areas used update/enumerate.

Type E: These LCOs were assigned to Puerto Rico only; the update/leave method of enumeration was the only one used; each LCO was responsible for between 152,000 and 160,000 HUs; and the LCOs were part of the Boston Regional Census Center.

Type F: The Anchorage, AK, LCO had its own designation due to the use of a modified list/enumerate method in remote Alaska.

Appendix C:

Census 2000 Full Cycle Obligations, Budget Authority, and Appropriations

(Direct obligations in thousands of current dollars)

Budget framework	1991 actual	1992 actual	1993 actual	1994 actual	1995 actual	Through 1995 total	Budget framework	1996 actual	1997 actual	1998 actual	1999 actual	2000 actual	2001 actual ²	2002 actual ²	2003 actual	2004 actual	1996 through 2003 total	1991 through 2003 total
Program development and management information	\$ 1,445	\$ 890	\$ 529	\$ 1,063	\$ 2,390	\$ 6,317	Program development and management	\$ 8,239	\$ 5,378	\$ 33,000	\$ 24,608	\$ 21,270	\$ 25,734	\$ 8,180	\$ 3,878	\$ -	\$ 130,287	-
Content requirements and public use forms	-	800	1,791	725	1,545	4,861	Data, content, and products	9,828	12,260	24,278	120,505	218,286	61,277	72,237	41,725	-	560,196	-
Test census and dress rehearsal	-	-	-	5,524	29,707	35,231	Field data collection and support systems	13,289	20,814	93,500	324,761	3,059,614	141,307	15,286	17,086	9,779	3,695,436	-
Decennial geographic support	-	520	419	-	1,267	2,206	Address list development	2,316	2,484	70,554	294,122	44,833	4,107	32	7	-	418,455	-
Evaluation and development	-	4,186	6,031	7,135	5,035	22,387	Automated data processing and telecommunications support	6,771	20,251	97,937	151,730	493,476	135,941	25,220	12,117	-	943,443	-
Address list compilation	-	1,080	992	119	-	2,191	Testing, evaluations and dress rehearsal	9,430	19,808	42,813	30,738	13,288	56,313	22,106	14,225	-	208,721	-
Stakeholder education and consultation	-	395	255	149	368	1,167	Puerto Rico, Virgin Islands, and Pacific Areas	256	861	2,436	10,792	57,417	9,663	2,667	2,519	-	86,611	-
Tabulation, publication, and data user services	-	170	-	-	-	170	Marketing, communications and partnerships	1,426	4,551	21,748	126,694	197,907	7,199	2,208	859	-	362,592	-
Automation/telecommunication support	-	1,400	3,735	4,002	621	9,758												
Audit adjustment	-	-	-	-	-	-						10,453	-	-	-	-	10,453	-
Gross obligations	\$ 1,445	\$ 9,441	\$13,752	\$18,717	\$40,933	\$84,288		\$51,355	\$86,407	\$ 386,266	\$ 1,083,950	\$ 4,116,544	\$ 441,541	\$ 147,936	\$92,416	\$ 9,779	\$ 6,416,194	\$ 6,500,482
Recovery of prior year obligations	(7)	(3)	(36)	(10,747)	-	(10,793)		(908)	(769)	(380)	(2,968)	(4,897)	(69,957)	(28,306)	(7,131)	-	(115,316)	(126,109)
Unobligated balance start of year	-	(99)	(716)	-	(152)	(967)		(1,193)	(1,273)	-	(3,798)	(4,558)	(321,264)	(72,355)	(44,778)	(9,779)	(458,998)	(459,965)
Unobligated balance end of year	99	716	-	152	1,170	2,137		(429)	(255)	-	1,428	359,891	74,254	34,969	9,193	-	479,051	481,188
Refund	-	-	-	-	-	-		-	-	-	-	-	-	-	(8,078)	-	(8,078)	(8,078)
Offsetting collection	-	-	-	-	-	-		-	-	-	-	-	(1,144)	(8,528)	-	-	(9,672)	(9,672)
Budget authority available	\$ 1,537	\$10,055	\$13,000	\$ 8,122	\$41,951	\$74,665		\$48,825	\$84,110	\$ 385,886	\$1,078,612	\$ 4,466,980	\$ 123,430	\$ 73,716	\$41,622	\$ -	\$ 6,303,181	\$ 6,377,846
Transfer from other accounts	-	-	-	-	-	-		-	-	-	(10,900)	-	-	-	-	-	(10,900)	(10,900)
Transfer to other accounts (CMB and DoC IG)	-	-	-	-	-	-		-	-	4,000	4,000	3,935	3,500	-	-	-	15,435	15,435
Reprogramming (DSSR)	-	-	-	-	-	-		-	-	-	-	-	3,687	-	-	-	3,687	3,687
Appropriation	\$ 1,537	\$10,055	\$13,000	\$ 8,122	\$41,951	\$74,665		\$48,825	\$84,110	\$ 389,886	\$1,071,712	\$ 4,470,915	\$ 130,617	\$ 73,716	\$41,622	\$ -	\$ 6,311,403	\$ 6,386,068

¹ FY 2000 Reported Costs are \$4,116,544. A \$10.5 million audit adjustment for printing reveals actual costs of \$4,106,091.

² Of the \$359.9 million in FY 2000 unobligated balance, Congress allocated \$300 million to offset FY 2001 direct appropriations—\$260 million to the decennial census and \$40 million to the Suttland Federal Center. As directed in Public Law 106-553, the remaining \$59.9 million in unobligated balance not allocated by Congress required notification of Congress for allocation.

³ Of the \$74.3 million in unobligated balance at the end of FY 01, Congress allocated \$54 million to offset direct appropriations. Allocation of the remaining balance required congressional notification.

Note: Total full cycle obligations overstate the cost of Census 2000 due to reobligation of recoveries. The following frameworks were removed from the table because they had no expenditures in this time period: precensus day operations and support systems; postcensus day operations; Puerto Rico and outlying areas; Year 2001 and beyond; cooperation with the U.S. Postal Service; follow-on surveys.

Source: U.S. Census Bureau, Budget Division

Appendix D: Census 2000 Short (100 Percent) Form

United States
**Census
2000**

U.S. Department of Commerce • Bureau of the Census



This is the official form for all the people at this address. It is quick and easy, and your answers are protected by law. Complete the Census and help your community get what it needs — today and in the future!

Start Here

Please use a
black or blue pen.

1. How many people were living or staying in this house, apartment, or mobile home on April 1, 2000?

Number of people

INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2000 who have no other permanent place to stay
- people living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while attending college
- people in a correctional facility, nursing home, or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- people who live or stay at another place most of the time

2. Is this house, apartment, or mobile home — Mark ☒ ONE box.

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent?

3. Please answer the following questions for each person living in this house, apartment, or mobile home. Start with the name of one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here. We will refer to this person as Person 1.

What is this person's name? Print name below.

Last Name

First Name

MI

OMB No. 0607-0856: Approval Expires 12/31/2000

Form **D-61A**

4. What is Person 1's telephone number? We may call this person if we don't understand an answer.

Area Code + Number

- -

5. What is Person 1's sex? Mark ☒ ONE box.

☐ Male ☐ Female

6. What is Person 1's age and what is Person 1's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

→ **NOTE: Please answer BOTH Questions 7 and 8.**

7. Is Person 1 Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ No, not Spanish/Hispanic/Latino ☐ Yes, Puerto Rican
- ☐ Yes, Mexican, Mexican Am., Chicano ☐ Yes, Cuban
- ☐ Yes, other Spanish/Hispanic/Latino — Print group. ↗

8. What is Person 1's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — Print name of enrolled or principal tribe. ↗

- ☐ Asian Indian ☐ Japanese ☐ Native Hawaiian
- ☐ Chinese ☐ Korean ☐ Guamanian or Chamorro
- ☐ Filipino ☐ Vietnamese ☐ Samoan
- ☐ Other Asian — Print race. ↗ ☐ Other Pacific Islander — Print race. ↗

- ☐ Some other race — Print race. ↗

→ If more people live here, continue with Person 2.

Person 2

Your answers are important!
Every person in the Census counts.



1. What is Person 2's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? *Mark ☒ ONE box.*

☐ Husband/wife

If NOT RELATED to Person 1:

☐ Natural-born son/daughter

☐ Roomer, boarder

☐ Adopted son/daughter

☐ Housemate, roommate

☐ Stepson/stepdaughter

☐ Unmarried partner

☐ Brother/sister

☐ Foster child

☐ Father/mother

☐ Other nonrelative

☐ Grandchild

☐ Parent-in-law

☐ Son-in-law/daughter-in-law

☐ Other relative — *Print exact relationship.* →

3. What is this person's sex? *Mark ☒ ONE box.*

☐ Male

☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000

Month

Day

Year of birth

→ **NOTE:** Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? *Mark ☒ the "No" box if not Spanish/Hispanic/Latino.*

☐ **No**, not Spanish/Hispanic/Latino

☐ Yes, Puerto Rican

☐ Yes, Mexican, Mexican Am., Chicano

☐ Yes, Cuban

☐ Yes, other Spanish/Hispanic/Latino — *Print group.* ↗

6. What is this person's race? *Mark ☒ one or more races to indicate what this person considers himself/herself to be.*

☐ White

☐ Black, African Am., or Negro

☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↗

☐ Asian Indian ☐ Japanese ☐ Native Hawaiian

☐ Chinese ☐ Korean ☐ Guamanian or Chamorro

☐ Filipino ☐ Vietnamese ☐ Samoan

☐ Other Asian — *Print race.* ↗ ☐ Other Pacific Islander — *Print race.* ↗

☐ Some other race — *Print race.* ↗

→ If more people live here, continue with Person 3.

Person 3

Census information helps your
community get financial
assistance for roads, hospitals,
schools, and more.



1. What is Person 3's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? *Mark ☒ ONE box.*

☐ Husband/wife

If NOT RELATED to Person 1:

☐ Natural-born son/daughter

☐ Roomer, boarder

☐ Adopted son/daughter

☐ Housemate, roommate

☐ Stepson/stepdaughter

☐ Unmarried partner

☐ Brother/sister

☐ Foster child

☐ Father/mother

☐ Other nonrelative

☐ Grandchild

☐ Parent-in-law

☐ Son-in-law/daughter-in-law

☐ Other relative — *Print exact relationship.* →

3. What is this person's sex? *Mark ☒ ONE box.*

☐ Male

☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000

Month

Day

Year of birth

→ **NOTE:** Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? *Mark ☒ the "No" box if not Spanish/Hispanic/Latino.*

☐ **No**, not Spanish/Hispanic/Latino

☐ Yes, Puerto Rican

☐ Yes, Mexican, Mexican Am., Chicano

☐ Yes, Cuban

☐ Yes, other Spanish/Hispanic/Latino — *Print group.* ↗

6. What is this person's race? *Mark ☒ one or more races to indicate what this person considers himself/herself to be.*

☐ White

☐ Black, African Am., or Negro

☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↗

☐ Asian Indian ☐ Japanese ☐ Native Hawaiian

☐ Chinese ☐ Korean ☐ Guamanian or Chamorro

☐ Filipino ☐ Vietnamese ☐ Samoan

☐ Other Asian — *Print race.* ↗ ☐ Other Pacific Islander — *Print race.* ↗

☐ Some other race — *Print race.* ↗

→ If more people live here, continue with Person 4.

Person 4

Information about children helps
your community plan for child
care, education, and recreation.



1. What is Person 4's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? *Mark ☒ ONE box.*

- | | |
|--|--|
| <input type="checkbox"/> Husband/wife | If NOT RELATED to Person 1: |
| <input type="checkbox"/> Natural-born son/daughter | <input type="checkbox"/> Roomer, boarder |
| <input type="checkbox"/> Adopted son/daughter | <input type="checkbox"/> Housemate, roommate |
| <input type="checkbox"/> Stepson/stepdaughter | <input type="checkbox"/> Unmarried partner |
| <input type="checkbox"/> Brother/sister | <input type="checkbox"/> Foster child |
| <input type="checkbox"/> Father/mother | <input type="checkbox"/> Other nonrelative |
| <input type="checkbox"/> Grandchild | |
| <input type="checkbox"/> Parent-in-law | |
| <input type="checkbox"/> Son-in-law/daughter-in-law | |
| <input type="checkbox"/> Other relative — <i>Print exact relationship.</i> | <input type="text"/> |

3. What is this person's sex? *Mark ☒ ONE box.*

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000	Month	Day	Year of birth
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? *Mark ☒ the "No" box if not Spanish/Hispanic/Latino.*

- ☐ No, not Spanish/Hispanic/Latino ☐ Yes, Puerto Rican
☐ Yes, Mexican, Mexican Am., Chicano ☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latino — *Print group.*

6. What is this person's race? *Mark ☒ one or more races to indicate what this person considers himself/herself to be.*

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- | | | |
|---|--|--|
| <input type="checkbox"/> Asian Indian | <input type="checkbox"/> Japanese | <input type="checkbox"/> Native Hawaiian |
| <input type="checkbox"/> Chinese | <input type="checkbox"/> Korean | <input type="checkbox"/> Guamanian or Chamorro |
| <input type="checkbox"/> Filipino | <input type="checkbox"/> Vietnamese | <input type="checkbox"/> Samoan |
| <input type="checkbox"/> Other Asian — <i>Print race.</i> | <input type="checkbox"/> Other Pacific Islander — <i>Print race.</i> | |

- ☐ Some other race — *Print race.*

→ If more people live here, continue with Person 5.

Person 5

Knowing about age, race, and
sex helps your community
better meet the needs of
everyone.



1. What is Person 5's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? *Mark ☒ ONE box.*

- | | |
|--|--|
| <input type="checkbox"/> Husband/wife | If NOT RELATED to Person 1: |
| <input type="checkbox"/> Natural-born son/daughter | <input type="checkbox"/> Roomer, boarder |
| <input type="checkbox"/> Adopted son/daughter | <input type="checkbox"/> Housemate, roommate |
| <input type="checkbox"/> Stepson/stepdaughter | <input type="checkbox"/> Unmarried partner |
| <input type="checkbox"/> Brother/sister | <input type="checkbox"/> Foster child |
| <input type="checkbox"/> Father/mother | <input type="checkbox"/> Other nonrelative |
| <input type="checkbox"/> Grandchild | |
| <input type="checkbox"/> Parent-in-law | |
| <input type="checkbox"/> Son-in-law/daughter-in-law | |
| <input type="checkbox"/> Other relative — <i>Print exact relationship.</i> | <input type="text"/> |

3. What is this person's sex? *Mark ☒ ONE box.*

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000	Month	Day	Year of birth
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? *Mark ☒ the "No" box if not Spanish/Hispanic/Latino.*

- ☐ No, not Spanish/Hispanic/Latino ☐ Yes, Puerto Rican
☐ Yes, Mexican, Mexican Am., Chicano ☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latino — *Print group.*

6. What is this person's race? *Mark ☒ one or more races to indicate what this person considers himself/herself to be.*

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- | | | |
|---|--|--|
| <input type="checkbox"/> Asian Indian | <input type="checkbox"/> Japanese | <input type="checkbox"/> Native Hawaiian |
| <input type="checkbox"/> Chinese | <input type="checkbox"/> Korean | <input type="checkbox"/> Guamanian or Chamorro |
| <input type="checkbox"/> Filipino | <input type="checkbox"/> Vietnamese | <input type="checkbox"/> Samoan |
| <input type="checkbox"/> Other Asian — <i>Print race.</i> | <input type="checkbox"/> Other Pacific Islander — <i>Print race.</i> | |

- ☐ Some other race — *Print race.*

→ If more people live here, continue with Person 6.



Person 6

Your answers help
your community plan
for the future.



1. What is Person 6's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? Mark ☒ ONE box.

☐ Husband/wife

If NOT RELATED to Person 1:

☐ Natural-born son/daughter

☐ Roomer, boarder

☐ Adopted son/daughter

☐ Housemate, roommate

☐ Stepson/stepdaughter

☐ Unmarried partner

☐ Brother/sister

☐ Foster child

☐ Father/mother

☐ Other nonrelative

☐ Grandchild

☐ Parent-in-law

☐ Son-in-law/daughter-in-law

☐ Other relative — *Print exact relationship.* →

3. What is this person's sex? Mark ☒ ONE box.

☐ Male

☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000

Month

Day

Year of birth

→ **NOTE: Please answer BOTH Questions 5 and 6.**

5. Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

☐ No, not Spanish/Hispanic/Latino

☐ Yes, Puerto Rican

☐ Yes, Mexican, Mexican Am., Chicano

☐ Yes, Cuban

☐ Yes, other Spanish/Hispanic/Latino — *Print group.* ↗

6. What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

☐ White

☐ Black, African Am., or Negro

☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↗

☐ Asian Indian

☐ Japanese

☐ Native Hawaiian

☐ Chinese

☐ Korean

☐ Guamanian or Chamorro

☐ Filipino

☐ Vietnamese

☐ Samoan

☐ Other Asian — *Print race.* ↗

☐ Other Pacific Islander — *Print race.* ↗

☐ Some other race — *Print race.* ↗

→ **If more people live here, list their names on the back of this page in the spaces provided.**

***Please turn
to go to last
page.***

Form D-61A

If you didn't have room to list everyone who lives in this house or apartment, please list the others below. You may be contacted by the Census Bureau for the same information about these people.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget.


The "Informational Copy" shows the content of the United States Census 2000 "short" form questionnaire. Each household will receive either a short form (100-percent questions) or a long form (100-percent and sample questions). The short form questionnaire contains 6 population questions and 1 housing question. On average, about 5 in every 6 households will receive the short form. The content of the forms resulted from reviewing the 1990 census data, consulting with federal and non-federal data users, and conducting tests.

For additional information about Census 2000, visit our website at **www.census.gov** or write to the Director, Bureau of the Census, Washington, DC 20233.

Appendix E: Census 2000 Long (Sample) Form

**United States
Census
2000**

U.S. Department of Commerce
Bureau of the Census



This is the official form for all the people at this address. It is quick and easy, and your answers are protected by law. Complete the Census and help your community get what it needs — today and in the future!

Start Here

Please use a black or blue pen.

1 How many people were living or staying in this house, apartment, or mobile home on April 1, 2000?

Number of people


INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2000 who have no other permanent place to stay
- people living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while attending college
- people in a correctional facility, nursing home, or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- people who live or stay at another place most of the time

→ Please turn the page and print the names of all the people living or staying here on April 1, 2000.



If you need help completing this form, call 1-800-471-9424 between 8:00 a.m. and 9:00 p.m., 7 days a week. The telephone call is free.

TDD – Telephone display device for the hearing impaired. Call 1-800-582-8330 between 8:00 a.m. and 9:00 p.m., 7 days a week. The telephone call is free.

¿NECESITA AYUDA? Si usted necesita ayuda para completar este cuestionario llame al 1-800-471-8642 entre las 8:00 a.m. y las 9:00 p.m., 7 días a la semana. La llamada telefónica es gratis.

The Census Bureau estimates that, for the average household, this form will take about 38 minutes to complete, including the time for reviewing the instructions and answers. Comments about the estimate should be directed to the Associate Director for Finance and Administration, Attn: Paperwork Reduction Project 0607-0856, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget.

Form **D-2**

OMB No. 0607-0856: Approval Expires 12/31/2000

List of Persons

➔ Please be sure you answered question 1 on the front page before continuing.

2 Please print the names of all the people who you indicated in question 1 were living or staying here on April 1, 2000.

Example — Last Name

J O H N S O N

First Name MI

R O B I N J

Start with the person, or one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here.

Person 1 — Last Name

First Name MI

Person 2 — Last Name

First Name MI

Person 3 — Last Name

First Name MI

Person 4 — Last Name

First Name MI

Person 5 — Last Name

First Name MI

Person 6 — Last Name

First Name MI

Person 7 — Last Name

First Name MI

Person 8 — Last Name

First Name MI

Person 9 — Last Name

First Name MI

Person 10 — Last Name

First Name MI

Person 11 — Last Name

First Name MI

Person 12 — Last Name

First Name MI

➔ Next, answer questions about Person 1.

FOR OFFICE USE ONLY

A. JIC1

B. JIC2

C. JIC3

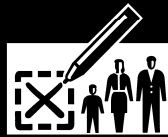
D. JIC4

Form D-2

2

Person

1



**Your answers
are important!
Every person in the
Census counts.**

1 What is this person's name? *Print the name of Person 1 from page 2.*

Last Name

First Name

MI

2 What is this person's telephone number? *We may contact this person if we don't understand an answer.*
Area Code + Number

3 What is this person's sex? Mark ☒ ONE box.

- ☐ Male
☐ Female

4 What is this person's age and what is this person's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

NOTE: Please answer BOTH Questions 5 and 6.

5 Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ **No**, not Spanish/Hispanic/Latino
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latino — *Print group.* ↗

6 What is this person's race? Mark ☒ one or **more races** to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↗

- ☐ Asian Indian
☐ Chinese
☐ Filipino
☐ Japanese
☐ Korean
☐ Vietnamese
☐ Other Asian — *Print race.* ↗
- ☐ Native Hawaiian
☐ Guamanian or Chamorro
☐ Samoan
☐ Other Pacific Islander — *Print race.* ↗

- ☐ Some other race — *Print race.* ↗

7 What is this person's marital status?

- ☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married

8 a. At any time since February 1, 2000, has this person attended regular school or college?
Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

- ☐ No, has not attended since February 1 → *Skip to 9*
☐ Yes, public school, public college
☐ Yes, private school, private college



Person 1 (continued)

- 8 b. What grade or level was this person attending?** Mark ☒ ONE box.
- Mark ☒ ONE box.*
- ☐ Nursery school, preschool
 - ☐ Kindergarten
 - ☐ Grade 1 to grade 4
 - ☐ Grade 5 to grade 8
 - ☐ Grade 9 to grade 12
 - ☐ College undergraduate years (freshman to senior)
 - ☐ Graduate or professional school (for example: medical, dental, or law school)
- 9 What is the highest degree or level of school this person has COMPLETED?** Mark ☒ ONE box.
- If currently enrolled, mark the previous grade or highest degree received.*
- ☐ No schooling completed
 - ☐ Nursery school to 4th grade
 - ☐ 5th grade or 6th grade
 - ☐ 7th grade or 8th grade
 - ☐ 9th grade
 - ☐ 10th grade
 - ☐ 11th grade
 - ☐ 12th grade, **NO DIPLOMA**
 - ☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
 - ☐ Some college credit, but less than 1 year
 - ☐ 1 or more years of college, no degree
 - ☐ Associate degree (for example: AA, AS)
 - ☐ Bachelor's degree (for example: BA, AB, BS)
 - ☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
 - ☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
 - ☐ Doctorate degree (for example: PhD, EdD)

- [illegible]

- 11** a. Does this person speak a language other than English at home?
- ☐ Yes
- ☐ No → *Skip to 12*

- b. What is this language?**

(For example: Korean, Italian, Spanish, Vietnamese)

- c. How well does this person speak English?

- ☐ Very well
- ☐ Well
- ☐ Not well
- ☐ Not at all

- 12** Where was this person born?

- ☐
- In the United States —
- Print name of state.*

- ☐ Outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc.*

- 13** Is this person a **CITIZEN** of the United States?

- ☐ Yes, born in the United States → *Skip to 15a*
- ☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
- ☐ Yes, born abroad of American parent or parents
- ☐ Yes, a U.S. citizen by naturalization
- ☐ No, not a citizen of the United States

- 14** When did this person come to live in the United States? *Print numbers in boxes.*

Year

- 15** a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?

- ☐ Person is under 5 years old → *Skip to 33*
- ☐ Yes, this house → *Skip to 16*
- ☐ No, outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc., below; then skip to 16.*

- ☐
- No, different house in the United States

27

28

29

30

31

Person 1 (continued)

- 38** How many bedrooms do you have; that is, how many bedrooms would you list if this house, apartment, or mobile home were on the market for sale or rent?

☐ No bedroom
☐ 1 bedroom
☐ 2 bedrooms
☐ 3 bedrooms
☐ 4 bedrooms
☐ 5 or more bedrooms

- 39** Do you have COMPLETE plumbing facilities in this house, apartment, or mobile home; that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

☐ Yes, have all three facilities
☐ No

- 40** Do you have COMPLETE kitchen facilities in this house, apartment, or mobile home; that is, 1) a sink with piped water, 2) a range or stove, and 3) a refrigerator?

☐ Yes, have all three facilities
☐ No

- 41** Is there telephone service available in this house, apartment, or mobile home from which you can both make and receive calls?

☐ Yes
☐ No

- 42** Which FUEL is used MOST for heating this house, apartment, or mobile home?

☐ Gas: from underground pipes serving the neighborhood
☐ Gas: bottled, tank, or LP
☐ Electricity
☐ Fuel oil, kerosene, etc.
☐ Coal or coke
☐ Wood
☐ Solar energy
☐ Other fuel
☐ No fuel used

- 43** How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

☐ None
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6 or more

- 44** Answer ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME — All others skip to 45.

a. Is there a business (such as a store or barber shop) or a medical office on this property?

☐ Yes
☐ No

b. How many acres is this house or mobile home on?

☐ Less than 1 acre → Skip to 45
☐ 1 to 9.9 acres
☐ 10 or more acres

c. In 1999, what were the actual sales of all agricultural products from this property?

☐ None ☐ \$2,500 to \$4,999
☐ \$1 to \$999 ☐ \$5,000 to \$9,999
☐ \$1,000 to \$2,499 ☐ \$10,000 or more

- 45** What are the annual costs of utilities and fuels for this house, apartment, or mobile home? If you have lived here less than 1 year, estimate the annual cost.

a. Electricity

Annual cost — Dollars

\$, .00

OR

☐ Included in rent or in condominium fee
☐ No charge or electricity not used

b. Gas

Annual cost — Dollars

\$, .00

OR

☐ Included in rent or in condominium fee
☐ No charge or gas not used

c. Water and sewer

Annual cost — Dollars

\$, .00

OR

☐ Included in rent or in condominium fee
☐ No charge

d. Oil, coal, kerosene, wood, etc.

Annual cost — Dollars

\$, .00

OR

☐ Included in rent or in condominium fee
☐ No charge or these fuels not used



Person 1 (continued)

- 46** Answer **ONLY** if you **PAY RENT** for this house, apartment, or mobile home — All others skip to 47.

a. What is the monthly rent?

Monthly amount — Dollars

\$, .00

b. Does the monthly rent include any meals?

- ☐ Yes
☐ No

- 47** Answer questions 47a—53 if you or someone in this household owns or is buying this house, apartment, or mobile home; otherwise, skip to questions for Person 2.

a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?

- ☐ Yes, mortgage, deed of trust, or similar debt
☐ Yes, contract to purchase
☐ No → Skip to 48a

b. How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.

Monthly amount — Dollars

\$, .00

OR

☐ No regular payment required → Skip to 48a

c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?

- ☐ Yes, taxes included in mortgage payment
☐ No, taxes paid separately or taxes not required

d. Does your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

- ☐ Yes, insurance included in mortgage payment
☐ No, insurance paid separately or no insurance

- 48** a. Do you have a second mortgage or a home equity loan on THIS property? Mark ☒ all boxes that apply.

- ☐ Yes, a second mortgage
☐ Yes, a home equity loan
☐ No → Skip to 49

b. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?

Monthly amount — Dollars

\$, .00

OR

☐ No regular payment required

- 49** What were the real estate taxes on THIS property last year?

Yearly amount — Dollars

\$, .00

OR

☐ None

- 50** What was the annual payment for fire, hazard, and flood insurance on THIS property?

Annual amount — Dollars

\$, .00

OR

☐ None

- 51** What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?

- | | |
|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$90,000 to \$99,999 |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$100,000 to \$124,999 |
| <input type="checkbox"/> \$15,000 to \$19,999 | <input type="checkbox"/> \$125,000 to \$149,999 |
| <input type="checkbox"/> \$20,000 to \$24,999 | <input type="checkbox"/> \$150,000 to \$174,999 |
| <input type="checkbox"/> \$25,000 to \$29,999 | <input type="checkbox"/> \$175,000 to \$199,999 |
| <input type="checkbox"/> \$30,000 to \$34,999 | <input type="checkbox"/> \$200,000 to \$249,999 |
| <input type="checkbox"/> \$35,000 to \$39,999 | <input type="checkbox"/> \$250,000 to \$299,999 |
| <input type="checkbox"/> \$40,000 to \$49,999 | <input type="checkbox"/> \$300,000 to \$399,999 |
| <input type="checkbox"/> \$50,000 to \$59,999 | <input type="checkbox"/> \$400,000 to \$499,999 |
| <input type="checkbox"/> \$60,000 to \$69,999 | <input type="checkbox"/> \$500,000 to \$749,999 |
| <input type="checkbox"/> \$70,000 to \$79,999 | <input type="checkbox"/> \$750,000 to \$999,999 |
| <input type="checkbox"/> \$80,000 to \$89,999 | <input type="checkbox"/> \$1,000,000 or more |

- 52** Answer **ONLY** if this is a **CONDOMINIUM** —

What is the monthly condominium fee?

Monthly amount — Dollars

\$, .00

- 53** Answer **ONLY** if this is a **MOBILE HOME** —

a. Do you have an installment loan or contract on THIS mobile home?

- ☐ Yes
☐ No

b. What was the total cost for installment loan payments, personal property taxes, site rent, registration fees, and license fees on THIS mobile home and its site last year? Exclude real estate taxes.

Yearly amount — Dollars

\$, .00

- Are there more people living here? If yes, continue with Person 2.

Person

2



Census information helps your community get financial assistance for roads, hospitals, schools and more.

1 What is this person's name? Print the name of Person 2 from page 2.

Last Name

First Name

MI

2 How is this person related to Person 1? Mark ☒ ONE box.

- ☐ Husband/wife
- ☐ Natural-born son/daughter
- ☐ Adopted son/daughter
- ☐ Stepson/stepdaughter
- ☐ Brother/sister
- ☐ Father/mother
- ☐ Grandchild
- ☐ Parent-in-law
- ☐ Son-in-law/daughter-in-law
- ☐ Other relative — Print exact relationship.

If NOT RELATED to Person 1:

- ☐ Roomer, boarder
- ☐ Housemate, roommate
- ☐ Unmarried partner
- ☐ Foster child
- ☐ Other nonrelative

3 What is this person's sex? Mark ☒ ONE box.

- ☐ Male
- ☐ Female

4 What is this person's age and what is this person's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

NOTE: Please answer BOTH Questions 5 and 6.

5 Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ No, not Spanish/Hispanic/Latino
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, other Spanish/Hispanic/Latino — Print group. ↘

6 What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — Print name of enrolled or principal tribe. ↘

- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian — Print race. ↘
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander — Print race. ↘

- ☐ Some other race — Print race. ↘

7 What is this person's marital status?

- ☐ Now married
- ☐ Widowed
- ☐ Divorced
- ☐ Separated
- ☐ Never married



Person 2 (continued)

- 8 a. At any time since February 1, 2000, has this person attended regular school or college?** *Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.*

- ☐ No, has not attended since February 1 → *Skip to 9*
☐ Yes, public school, public college
☐ Yes, private school, private college

- b. What grade or level was this person attending?**
 Mark ☒ ONE box.

- ☐ Nursery school, preschool
☐ Kindergarten
☐ Grade 1 to grade 4
☐ Grade 5 to grade 8
☐ Grade 9 to grade 12
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school (for example: medical, dental, or law school)

- 9 What is the highest degree or level of school this person has COMPLETED?** Mark ☒ ONE box.
If currently enrolled, mark the previous grade or highest degree received.

- ☐ No schooling completed
☐ Nursery school to 4th grade
☐ 5th grade or 6th grade
☐ 7th grade or 8th grade
☐ 9th grade
☐ 10th grade
☐ 11th grade
☐ 12th grade, **NO DIPLOMA**
☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
☐ Some college credit, but less than 1 year
☐ 1 or more years of college, no degree
☐ Associate degree (for example: AA, AS)
☐ Bachelor's degree (for example: BA, AB, BS)
☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
☐ Doctorate degree (for example: PhD, EdD)

- 10 What is this person's ancestry or ethnic origin?**

(For example: Italian, Jamaican, African Am., Cambodian, Cape Verdean, Norwegian, Dominican, French Canadian, Haitian, Korean, Lebanese, Polish, Nigerian, Mexican, Taiwanese, Ukrainian, and so on.)

- 11 a. Does this person speak a language other than English at home?**

- ☐ Yes
☐ No → *Skip to 12*

- b. What is this language?**

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(For example: Korean, Italian, Spanish, Vietnamese)

- c. How well does this person speak English?**

- ☐ Very well
☐ Well
☐ Not well
☐ Not at all

- 12 Where was this person born?**

- ☐ In the United States — *Print name of state.*

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- ☐ Outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc.*

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

- 13 Is this person a CITIZEN of the United States?**

- ☐ Yes, born in the United States → *Skip to 15a*
☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
☐ Yes, born abroad of American parent or parents
☐ Yes, a U.S. citizen by naturalization
☐ No, not a citizen of the United States

- 14 When did this person come to live in the United States?** *Print numbers in boxes.*

Year

--	--	--	--	--	--

- 15 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?**

- ☐ Person is under 5 years old → *Skip to 33*
☐ Yes, this house → *Skip to 16*
☐ No, outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc., below; then skip to 16.*

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

- ☐ No, different house in the United States

Person 2 (continued)

15 b. Where did this person live 5 years ago?

Name of city, town, or post office

Did this person live inside the limits of the city or town?

- ☐ Yes
☐ No, outside the city/town limits

Name of county

Name of state

ZIP Code

16 Does this person have any of the following long-lasting conditions:

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Blindness, deafness, or a severe vision or hearing impairment? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying? | <input type="checkbox"/> | <input type="checkbox"/> |

17 Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Learning, remembering, or concentrating? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Dressing, bathing, or getting around inside the home? | <input type="checkbox"/> | <input type="checkbox"/> |
| c. (Answer if this person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor's office? | <input type="checkbox"/> | <input type="checkbox"/> |
| d. (Answer if this person is 16 YEARS OLD OR OVER.) Working at a job or business? | <input type="checkbox"/> | <input type="checkbox"/> |

18 Was this person under 15 years of age on April 1, 2000?

- ☐ Yes → Skip to 33
☐ No

19 a. Does this person have any of his/her own grandchildren under the age of 18 living in this house or apartment?

- ☐ Yes
☐ No → Skip to 20a

b. Is this grandparent currently responsible for most of the basic needs of any grandchild(ren) under the age of 18 who live(s) in this house or apartment?

- ☐ Yes
☐ No → Skip to 20a

c. How long has this grandparent been responsible for the(se) grandchild(ren)? If the grandparent is financially responsible for more than one grandchild, answer the question for the grandchild for whom the grandparent has been responsible for the longest period of time.

- ☐ Less than 6 months
☐ 6 to 11 months
☐ 1 or 2 years
☐ 3 or 4 years
☐ 5 years or more

20 a. Has this person ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.

- ☐ Yes, now on active duty
☐ Yes, on active duty in past, but not now
☐ No, training for Reserves or National Guard only → Skip to 21
☐ No, never served in the military → Skip to 21

b. When did this person serve on active duty in the U.S. Armed Forces? Mark (X) a box for EACH period in which this person served.

- ☐ April 1995 or later
☐ August 1990 to March 1995 (including Persian Gulf War)
☐ September 1980 to July 1990
☐ May 1975 to August 1980
☐ Vietnam era (August 1964—April 1975)
☐ February 1955 to July 1964
☐ Korean conflict (June 1950—January 1955)
☐ World War II (September 1940—July 1947)
☐ Some other time

c. In total, how many years of active-duty military service has this person had?

- ☐ Less than 2 years
☐ 2 years or more



Person 2 (continued)

- ☐ 1995 to 2000
- ☐ 1994 or earlier, or never worked → *Skip to 31*

27

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31

\$,			.00
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\$ _____ .00

Loss



31 **c. Interest, dividends, net rental income, royalty income, or income from estates and trusts** — *Report even small amounts credited to an account.*

☐ Yes Annual amount — Dollars

\$, .00 ☐ Loss

☐ No

d. Social Security or Railroad Retirement

☐ Yes Annual amount — Dollars

\$, .00

☐ No

e. Supplemental Security Income (SSI)

☐ Yes Annual amount — Dollars

\$, .00

☐ No

f. Any public assistance or welfare payments from the state or local welfare office

☐ Yes Annual amount — Dollars

\$, .00

☐ No

g. Retirement, survivor, or disability pensions — *Do NOT include Social Security.*

☐ Yes Annual amount — Dollars

\$, .00

☐ No

h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — *Do NOT include lump-sum payments such as money from an inheritance or sale of a home.*

☐ Yes Annual amount — Dollars

\$, .00

☐ No

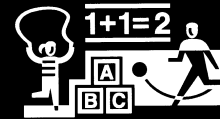
32 **What was this person's total income in 1999?** *Add entries in questions 31a—31h; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.*

Annual amount — Dollars

☐ None OR \$, .00 ☐ Loss

33 **Are there more people living here? If yes, continue with Person 3.**

3



Information about children helps your community plan for child care, education, and recreation.

- 1 What is this person's name? Print the name of Person 3 from page 2.**

Last Name

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

First Name

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

2 How is this person related to Person 1? Mark (☒) ONE box.

 - ☐ Husband/wife
 - ☐ Natural-born son/daughter
 - ☐ Adopted son/daughter
 - ☐ Stepson/stepdaughter
 - ☐ Brother/sister
 - ☐ Father/mother
 - ☐ Grandchild
 - ☐ Parent-in-law
 - ☐ Son-in-law/daughter-in-law
 - ☐ Other relative — *Print exact relationship.*

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

If NOT RELATED to Person 1:

 - ☐ Roomer, boarder
 - ☐ Housemate, roommate
 - ☐ Unmarried partner
 - ☐ Foster child
 - ☐ Other nonrelative

3 What is this person's sex? Mark (☒) ONE box.

 - ☐ Male
 - ☐ Female

4 What is this person's age and what is this person's date of birth?

Age on April 1, 2000

--	--	--

Print numbers in boxes.

Month Day Year of birth

--	--	--	--	--	--

Person 3 (continued)

→ NOTE: Please answer BOTH Questions 5 and 6.

5 Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ No, not Spanish/Hispanic/Latino
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latino — Print group. ↗

6 What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — Print name of enrolled or principal tribe. ↗

- | | |
|--|---|
| <input type="checkbox"/> Asian Indian | <input type="checkbox"/> Native Hawaiian |
| <input type="checkbox"/> Chinese | <input type="checkbox"/> Guamanian or Chamorro |
| <input type="checkbox"/> Filipino | <input type="checkbox"/> Samoan |
| <input type="checkbox"/> Japanese | <input type="checkbox"/> Other Pacific Islander — Print race. ↗ |
| <input type="checkbox"/> Korean | |
| <input type="checkbox"/> Vietnamese | |
| <input type="checkbox"/> Other Asian — Print race. ↗ | |

☐ Some other race — Print race. ↗

7 What is this person's marital status?

- ☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married

8 a. At any time since February 1, 2000, has this person attended regular school or college? Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

- ☐ No, has not attended since February 1 → Skip to 9
☐ Yes, public school, public college
☐ Yes, private school, private college

b. What grade or level was this person attending? Mark ☒ ONE box.

- ☐ Nursery school, preschool
☐ Kindergarten
☐ Grade 1 to grade 4
☐ Grade 5 to grade 8
☐ Grade 9 to grade 12
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school (for example: medical, dental, or law school)

9 What is the highest degree or level of school this person has COMPLETED? Mark ☒ ONE box. If currently enrolled, mark the previous grade or highest degree received.

- ☐ No schooling completed
☐ Nursery school to 4th grade
☐ 5th grade or 6th grade
☐ 7th grade or 8th grade
☐ 9th grade
☐ 10th grade
☐ 11th grade
☐ 12th grade, **NO DIPLOMA**
☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
☐ Some college credit, but less than 1 year
☐ 1 or more years of college, no degree
☐ Associate degree (for example: AA, AS)
☐ Bachelor's degree (for example: BA, AB, BS)
☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
☐ Doctorate degree (for example: PhD, EdD)

10 What is this person's ancestry or ethnic origin?

(For example: Italian, Jamaican, African Am., Cambodian, Cape Verdean, Norwegian, Dominican, French Canadian, Haitian, Korean, Lebanese, Polish, Nigerian, Mexican, Taiwanese, Ukrainian, and so on.)



Person 3 (continued)

- 11 a. Does this person speak a language other than English at home?**

☐ Yes
☐ No → *Skip to 12*

- b. What is this language?**

(For example: Korean, Italian, Spanish, Vietnamese)

- c. How well does this person speak English?**

☐ Very well
☐ Well
☐ Not well
☐ Not at all

- 12 Where was this person born?**

☐ In the United States — *Print name of state.*

☐ Outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc.*

- 13 Is this person a CITIZEN of the United States?**

☐ Yes, born in the United States → *Skip to 15a*
☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
☐ Yes, born abroad of American parent or parents
☐ Yes, a U.S. citizen by naturalization
☐ No, not a citizen of the United States

- 14 When did this person come to live in the United States? *Print numbers in boxes.***

Year

- 15 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?**

☐ Person is under 5 years old → *Skip to 33*
☐ Yes, this house → *Skip to 16*
☐ No, outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc., below; then skip to 16.*

☐ No, different house in the United States

- 15 b. Where did this person live 5 years ago?**

Name of city, town, or post office

Did this person live inside the limits of the city or town?

☐ Yes
☐ No, outside the city/town limits

Name of county

Name of state

ZIP Code

- 16 Does this person have any of the following long-lasting conditions:**

	Yes	No
a. Blindness, deafness, or a severe vision or hearing impairment?	<input type="checkbox"/>	<input type="checkbox"/>
b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?	<input type="checkbox"/>	<input type="checkbox"/>

- 17 Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:**

	Yes	No
a. Learning, remembering, or concentrating?	<input type="checkbox"/>	<input type="checkbox"/>
b. Dressing, bathing, or getting around inside the home?	<input type="checkbox"/>	<input type="checkbox"/>
c. (Answer if this person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor's office?	<input type="checkbox"/>	<input type="checkbox"/>
d. (Answer if this person is 16 YEARS OLD OR OVER.) Working at a job or business?	<input type="checkbox"/>	<input type="checkbox"/>

- 18 Was this person under 15 years of age on April 1, 2000?**

☐ Yes → *Skip to 33*
☐ No

Person 3 (continued)

➔ If "Car, truck, or van" is marked in 23a, go to 23b. Otherwise, skip to 24a.

23 b. How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

- ☐ Drove alone
☐ 2 people
☐ 3 people
☐ 4 people
☐ 5 or 6 people
☐ 7 or more people

24 a. What time did this person usually leave home to go to work LAST WEEK?

____ : ____ ☐ a.m. ☐ p.m.

b. How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes

____ : ____

➔ Answer questions 25–26 for persons who did not work for pay or profit last week. Others skip to 27.

25 a. LAST WEEK, was this person on layoff from a job?

- ☐ Yes → Skip to 25c
☐ No

b. LAST WEEK, was this person TEMPORARILY absent from a job or business?

- ☐ Yes, on vacation, temporary illness, labor dispute, etc. → Skip to 26
☐ No → Skip to 25d

c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?

- ☐ Yes → Skip to 25e
☐ No

d. Has this person been looking for work during the last 4 weeks?

- ☐ Yes
☐ No → Skip to 26

e. LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?

- ☐ Yes, could have gone to work
☐ No, because of own temporary illness
☐ No, because of all other reasons (in school, etc.)

26 When did this person last work, even for a few days?

- ☐ 1995 to 2000
☐ 1994 or earlier, or never worked → Skip to 31

27 Industry or Employer — Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.

a. For whom did this person work? If now on active duty in the Armed Forces, mark ☒ this box → ☐ and print the branch of the Armed Forces.

Name of company, business, or other employer

b. What kind of business or industry was this? Describe the activity at location where employed. (For example: hospital, newspaper publishing, mail order house, auto repair shop, bank)

c. Is this mainly — Mark ☒ ONE box.

- ☐ Manufacturing?
☐ Wholesale trade?
☐ Retail trade?
☐ Other (agriculture, construction, service, government, etc.)?

28 Occupation

a. What kind of work was this person doing? (For example: registered nurse, personnel manager, supervisor of order department, auto mechanic, accountant)

b. What were this person's most important activities or duties? (For example: patient care, directing hiring policies, supervising order clerks, repairing automobiles, reconciling financial records)

Form D-2

20

29 Was this person — Mark ☒ ONE box.

- 30** a. LAST YEAR, 1999, did this person work at a job or business at any time?

- b. How many weeks did this person work in 1999?**
Count paid vacation, paid sick leave, and military service.
Weeks

- c. During the weeks WORKED in 1999, how many hours did this person usually work each WEEK?
Usual hours worked each WEEK

- For income received jointly, report, if possible, the appropriate share for each person; otherwise, report the whole amount for only one person and mark (X) the "No" box for the other person. If exact amount is not known, please give best estimate.

- a. Wages, salary, commissions, bonuses, or tips from all jobs** — Report amount before deductions for taxes, bonds, dues, or other items.

- ☐ Yes Annual amount — Dollars
- | | | | | | |
|----|--|--|---|--|-----|
| \$ | | | . | | .00 |
|----|--|--|---|--|-----|

- ☐
- No

- b. Self-employment income from own nonfarm businesses or farm businesses, including proprietorships and partnerships — Report NET income after business expenses.**

- ☐
- Yes Annual amount — Dollars
-
-
-
- ☐
- Loss

- ☐
- No

- 31 c. Interest, dividends, net rental income, royalty income, or income from estates and trusts** — *Report even small amounts credited to an account.*

- ☐ Yes Annual amount — *Dollars*
- \$, .00 ☐ Loss
- ☐ No

- d. Social Security or Railroad Retirement**

- ☐ Yes Annual amount — *Dollars*
- \$ | | , | | .00
- ☐ No

- e. Supplemental Security Income (SSI)**

- ☐ Yes Annual amount — *Dollars*
- \$ | | , | | .00
- ☐ No

- f. Any public assistance or welfare payments from the state or local welfare office**

- ☐ Yes Annual amount — *Dollars*
- \$ | | , | | .00
- ☐ No

- g. Retirement, survivor, or disability pensions —**
Do NOT include Social Security.

- ☐ Yes Annual amount — *Dollars*
- \$ | | | , | | .00
- ☐ No

- h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.**

- ☐ Yes Annual amount — *Dollars*
- \$ | | | , | | .00
- ☐ No

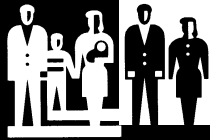
- 32** What was this person's total income in 1999? Add entries in questions 31a—31h; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

- Annual amount — Dollars
- ☐ None OR ☐ Loss

- 33** Are there more people living here? If yes, continue with Person 4.



Person 4



Knowing about age, race, and sex helps your community better meet the needs of everyone.

1 What is this person's name? Print the name of Person 4 from page 2.

Last Name

First Name

MI

2 How is this person related to Person 1? Mark ☒ ONE box.

- ☐ Husband/wife
- ☐ Natural-born son/daughter
- ☐ Adopted son/daughter
- ☐ Stepson/stepdaughter
- ☐ Brother/sister
- ☐ Father/mother
- ☐ Grandchild
- ☐ Parent-in-law
- ☐ Son-in-law/daughter-in-law
- ☐ Other relative — Print exact relationship.

If NOT RELATED to Person 1:

- ☐ Roomer, boarder
- ☐ Housemate, roommate
- ☐ Unmarried partner
- ☐ Foster child
- ☐ Other nonrelative

3 What is this person's sex? Mark ☒ ONE box.

- ☐ Male
- ☐ Female

4 What is this person's age and what is this person's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

NOTE: Please answer BOTH Questions 5 and 6.

5 Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ No, not Spanish/Hispanic/Latino
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, other Spanish/Hispanic/Latino — Print group. ↗

6 What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — Print name of enrolled or principal tribe. ↗

- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian — Print race. ↗
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander — Print race. ↗

- ☐ Some other race — Print race. ↗

7 What is this person's marital status?

- ☐ Now married
- ☐ Widowed
- ☐ Divorced
- ☐ Separated
- ☐ Never married

Person 4 (continued)

15 b. Where did this person live 5 years ago?

Name of city, town, or post office

Did this person live inside the limits of the city or town?

- ☐ Yes
- ☐ No, outside the city/town limits

Name of county

Name of state

ZIP Code

16 Does this person have any of the following long-lasting conditions:

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Blindness, deafness, or a severe vision or hearing impairment? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying? | <input type="checkbox"/> | <input type="checkbox"/> |

17 Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Learning, remembering, or concentrating? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Dressing, bathing, or getting around inside the home? | <input type="checkbox"/> | <input type="checkbox"/> |
| c. (Answer if this person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor's office? | <input type="checkbox"/> | <input type="checkbox"/> |
| d. (Answer if this person is 16 YEARS OLD OR OVER.) Working at a job or business? | <input type="checkbox"/> | <input type="checkbox"/> |

18 Was this person under 15 years of age on April 1, 2000?

- ☐ Yes → *Skip to 33*
- ☐ No

19 a. Does this person have any of his/her own grandchildren under the age of 18 living in this house or apartment?

- ☐ Yes
- ☐ No → *Skip to 20a*

b. Is this grandparent currently responsible for most of the basic needs of any grandchild(ren) under the age of 18 who live(s) in this house or apartment?

- ☐ Yes
- ☐ No → *Skip to 20a*

c. How long has this grandparent been responsible for the(se) grandchild(ren)? *If the grandparent is financially responsible for more than one grandchild, answer the question for the grandchild for whom the grandparent has been responsible for the longest period of time.*

- ☐ Less than 6 months
- ☐ 6 to 11 months
- ☐ 1 or 2 years
- ☐ 3 or 4 years
- ☐ 5 years or more

20 a. Has this person ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? *Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.*

- ☐ Yes, now on active duty
- ☐ Yes, on active duty in past, but not now
- ☐ No, training for Reserves or National Guard only → *Skip to 21*
- ☐ No, never served in the military → *Skip to 21*

b. When did this person serve on active duty in the U.S. Armed Forces? Mark ☒ a box for EACH period in which this person served.

- ☐ April 1995 or later
- ☐ August 1990 to March 1995 (including Persian Gulf War)
- ☐ September 1980 to July 1990
- ☐ May 1975 to August 1980
- ☐ Vietnam era (August 1964—April 1975)
- ☐ February 1955 to July 1964
- ☐ Korean conflict (June 1950—January 1955)
- ☐ World War II (September 1940—July 1947)
- ☐ Some other time

c. In total, how many years of active-duty military service has this person had?

- ☐ Less than 2 years
- ☐ 2 years or more

Person 4 (continued)

- ☐ Yes
- ☐ No → *Skip to 25a*

- a. Address (Number and street name)**

(If the exact address is not known, give a description of the location such as the building name or the nearest street or intersection.)

- b. Name of city, town, or post office**

c. Is the work location inside the limits of that city or town?

- ☐ Yes
- ☐ No, outside the city/town limits

- d. Name of county**

e. Name of U.S. state or foreign country

f. ZIP Code

23 a. How did this person usually get to work LAST WEEK? *If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

- ☐ Car, truck, or van
☐ Bus or trolley bus
☐ Streetcar or trolley car
☐ Subway or elevated
☐ Railroad
☐ Ferryboat
☐ Taxicab
☐ Motorcycle
☐ Bicycle
☐ Walked
☐ Worked at home → *Skip to 27*
☐ Other method

- 23** b. How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

- ☐ Drove alone
- ☐ 2 people
- ☐ 3 people
- ☐ 4 people
- ☐ 5 or 6 people
- ☐ 7 or more people

- 24** a. What time did this person usually leave home to go to work LAST WEEK?

: ☐ a.m. ☐ p.m.

- b. How many minutes did it usually take this person to get from home to work LAST WEEK?**

Minutes

➔ Answer questions 25–26 for persons who did not work for pay or profit last week. Others skip to 27.

- 25** a. LAST WEEK, was this person on layoff from a job?

- ☐ Yes → Skip to 25c
- ☐ No

- b. LAST WEEK, was this person TEMPORARILY absent from a job or business?**

- ☐ Yes, on vacation, temporary illness, labor dispute, etc. → *Skip to 26*
- ☐ No → *Skip to 25d*

- c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?**

- ☐ Yes → *Skip to 25e*
- ☐ No

- d. Has this person been looking for work during the last 4 weeks?**

- ☐ Yes
- ☐ No → *Skip to 26*

- e. LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?**

- ☐ Yes, could have gone to work
- ☐ No, because of own temporary illness
- ☐ No, because of all other reasons (*in school, etc.*)

- 26** When did this person last work, even for a few days?

- ☐ 1995 to 2000
- ☐ 1994 or earlier, or never worked → *Skip to 31*



Industry or Employer — Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.

Name of company, business, or other employer

- ☐ Manufacturing?
- ☐ Wholesale trade?
- ☐ Retail trade?
- ☐ Other (agriculture, construction, service, government, etc.)?

a. What kind of work was this person doing?
(For example: registered nurse, personnel manager, supervisor of order department, auto mechanic, accountant)

- ☐ Employee of a PRIVATE-FOR-PROFIT company or business or of an individual, for wages, salary, or commissions
- ☐ Employee of a PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization
- ☐ Local GOVERNMENT employee (*city, county, etc.*)
- ☐ State GOVERNMENT employee
- ☐ Federal GOVERNMENT employee
- ☐ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm
- ☐ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm
- ☐ Working WITHOUT PAY in family business or farm

☐ Yes

☐ No → *Skip to 31*

Usual hours worked each WEEK

For income received jointly, report, if possible, the appropriate share for each person; otherwise, report the whole amount for only one person and mark (X) the "No" box for the other person. If exact amount is not known, please give best estimate.

☐ Yes Annual amount — *Dollars*

\$, .00

☐ No☐ Yes Annual amount — *Dollars*

\$ _____ .00

☐ No

Loss

Person 4 (continued)

- 31 c. Interest, dividends, net rental income, royalty income, or income from estates and trusts** — Report even small amounts credited to an account.

☐ Yes Annual amount — Dollars
\$, .00 ☐ Loss

☐ No

- d. Social Security or Railroad Retirement**

☐ Yes Annual amount — Dollars
\$, .00

☐ No

- e. Supplemental Security Income (SSI)**

☐ Yes Annual amount — Dollars
\$, .00

☐ No

- f. Any public assistance or welfare payments from the state or local welfare office**

☐ Yes Annual amount — Dollars
\$, .00

☐ No

- g. Retirement, survivor, or disability pensions** — Do NOT include Social Security.

☐ Yes Annual amount — Dollars
\$, .00

☐ No

- h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony** — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

☐ Yes Annual amount — Dollars
\$, .00

☐ No

- 32 What was this person's total income in 1999?** Add entries in questions 31a—31h; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

Annual amount — Dollars
☐ None OR \$, .00 ☐ Loss

- 33 Are there more people living here? If yes, continue with Person 5.**

Person

5



Your answers help
your community
plan for the future.

- 1 What is this person's name?** Print the name of Person 5 from page 2.

Last Name

First Name

MI

- 2 How is this person related to Person 1?** Mark ☒ ONE box.

- ☐ Husband/wife
☐ Natural-born son/daughter
☐ Adopted son/daughter
☐ Stepson/stepdaughter
☐ Brother/sister
☐ Father/mother
☐ Grandchild
☐ Parent-in-law
☐ Son-in-law/daughter-in-law
☐ Other relative — Print exact relationship.

If NOT RELATED to Person 1:

- ☐ Roomer, boarder
☐ Housemate, roommate
☐ Unmarried partner
☐ Foster child
☐ Other nonrelative

- 3 What is this person's sex?** Mark ☒ ONE box.

- ☐ Male
☐ Female

- 4 What is this person's age and what is this person's date of birth?**

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth



Person 5 (continued)

→ NOTE: Please answer BOTH Questions 5 and 6.

5 Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ No, not Spanish/Hispanic/Latino
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latino — *Print group.* ↗

6 What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↗

- | | |
|---|--|
| <input type="checkbox"/> Asian Indian | <input type="checkbox"/> Native Hawaiian |
| <input type="checkbox"/> Chinese | <input type="checkbox"/> Guamanian or Chamorro |
| <input type="checkbox"/> Filipino | <input type="checkbox"/> Samoan |
| <input type="checkbox"/> Japanese | <input type="checkbox"/> Other Pacific Islander — <i>Print race.</i> ↗ |
| <input type="checkbox"/> Korean | |
| <input type="checkbox"/> Vietnamese | |
| <input type="checkbox"/> Other Asian — <i>Print race.</i> ↗ | |

- ☐ Some other race — *Print race.* ↗

7 What is this person's marital status?

- ☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married

8 a. At any time since February 1, 2000, has this person attended regular school or college? Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

- ☐ No, has not attended since February 1 → *Skip to 9*
☐ Yes, public school, public college
☐ Yes, private school, private college

b. What grade or level was this person attending? Mark ☒ ONE box.

- ☐ Nursery school, preschool
☐ Kindergarten
☐ Grade 1 to grade 4
☐ Grade 5 to grade 8
☐ Grade 9 to grade 12
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school (for example: medical, dental, or law school)

9 What is the highest degree or level of school this person has COMPLETED? Mark ☒ ONE box. If currently enrolled, mark the previous grade or highest degree received.

- ☐ No schooling completed
☐ Nursery school to 4th grade
☐ 5th grade or 6th grade
☐ 7th grade or 8th grade
☐ 9th grade
☐ 10th grade
☐ 11th grade
☐ 12th grade, **NO DIPLOMA**
☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
☐ Some college credit, but less than 1 year
☐ 1 or more years of college, no degree
☐ Associate degree (for example: AA, AS)
☐ Bachelor's degree (for example: BA, AB, BS)
☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
☐ Doctorate degree (for example: PhD, EdD)

10 What is this person's ancestry or ethnic origin?

(For example: Italian, Jamaican, African Am., Cambodian, Cape Verdean, Norwegian, Dominican, French Canadian, Haitian, Korean, Lebanese, Polish, Nigerian, Mexican, Taiwanese, Ukrainian, and so on.)

Person 5 (continued)

- 11 a. Does this person speak a language other than English at home?**

☐ Yes
☐ No → *Skip to 12*

- b. What is this language?**

(For example: Korean, Italian, Spanish, Vietnamese)

- c. How well does this person speak English?**

☐ Very well
☐ Well
☐ Not well
☐ Not at all

- 12 Where was this person born?**

☐ In the United States — *Print name of state.*

☐ Outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc.*

- 13 Is this person a CITIZEN of the United States?**

☐ Yes, born in the United States → *Skip to 15a*
☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
☐ Yes, born abroad of American parent or parents
☐ Yes, a U.S. citizen by naturalization
☐ No, not a citizen of the United States

- 14 When did this person come to live in the United States? Print numbers in boxes.**

Year

- 15 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?**

☐ Person is under 5 years old → *Skip to 33*
☐ Yes, this house → *Skip to 16*
☐ No, outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc., below; then skip to 16.*

☐ No, different house in the United States

- 15 b. Where did this person live 5 years ago?**

Name of city, town, or post office

Did this person live inside the limits of the city or town?

☐ Yes
☐ No, outside the city/town limits

Name of county

Name of state

ZIP Code

- 16 Does this person have any of the following long-lasting conditions:**

	Yes	No
a. Blindness, deafness, or a severe vision or hearing impairment?	<input type="checkbox"/>	<input type="checkbox"/>
b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?	<input type="checkbox"/>	<input type="checkbox"/>

- 17 Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:**

	Yes	No
a. Learning, remembering, or concentrating?	<input type="checkbox"/>	<input type="checkbox"/>
b. Dressing, bathing, or getting around inside the home?	<input type="checkbox"/>	<input type="checkbox"/>
c. (Answer if this person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor's office?	<input type="checkbox"/>	<input type="checkbox"/>
d. (Answer if this person is 16 YEARS OLD OR OVER.) Working at a job or business?	<input type="checkbox"/>	<input type="checkbox"/>

- 18 Was this person under 15 years of age on April 1, 2000?**

☐ Yes → *Skip to 33*
☐ No



Person 5 (continued)

➔ If "Car, truck, or van" is marked in 23a, go to 23b. Otherwise, skip to 24a.

23 b. How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

- ☐ Drove alone
☐ 2 people
☐ 3 people
☐ 4 people
☐ 5 or 6 people
☐ 7 or more people

24 a. What time did this person usually leave home to go to work LAST WEEK?

| | : | | ☐ a.m. ☐ p.m.

b. How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes

| | : | |

➔ Answer questions 25–26 for persons who did not work for pay or profit last week. Others skip to 27.

25 a. LAST WEEK, was this person on layoff from a job?

- ☐ Yes → Skip to 25c
☐ No

b. LAST WEEK, was this person TEMPORARILY absent from a job or business?

- ☐ Yes, on vacation, temporary illness, labor dispute, etc. → Skip to 26
☐ No → Skip to 25d

c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?

- ☐ Yes → Skip to 25e
☐ No

d. Has this person been looking for work during the last 4 weeks?

- ☐ Yes
☐ No → Skip to 26

e. LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?

- ☐ Yes, could have gone to work
☐ No, because of own temporary illness
☐ No, because of all other reasons (in school, etc.)

26 When did this person last work, even for a few days?

- ☐ 1995 to 2000
☐ 1994 or earlier, or never worked → Skip to 31

27 Industry or Employer — Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.

a. For whom did this person work? If now on active duty in the Armed Forces, mark ☒ this box → ☐ and print the branch of the Armed Forces.

Name of company, business, or other employer

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |

b. What kind of business or industry was this? Describe the activity at location where employed. (For example: hospital, newspaper publishing, mail order house, auto repair shop, bank)

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |

c. Is this mainly — Mark ☒ ONE box.

- ☐ Manufacturing?
☐ Wholesale trade?
☐ Retail trade?
☐ Other (agriculture, construction, service, government, etc.)?

28 Occupation

a. What kind of work was this person doing? (For example: registered nurse, personnel manager, supervisor of order department, auto mechanic, accountant)

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |

b. What were this person's most important activities or duties? (For example: patient care, directing hiring policies, supervising order clerks, repairing automobiles, reconciling financial records)

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |



Person 5 (continued)

- 29** Was this person — Mark ☒ ONE box.
- ☐ Employee of a PRIVATE-FOR-PROFIT company or business or of an individual, for wages, salary, or commissions
 - ☐ Employee of a PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization
 - ☐ Local GOVERNMENT employee (city, county, etc.)
 - ☐ State GOVERNMENT employee
 - ☐ Federal GOVERNMENT employee
 - ☐ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm
 - ☐ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm
 - ☐ Working WITHOUT PAY in family business or farm

- 30** a. LAST YEAR, 1999, did this person work at a job or business at any time?

- ☐ Yes
☐ No → Skip to 31

b. How many weeks did this person work in 1999? Count paid vacation, paid sick leave, and military service.
 Weeks

c. During the weeks WORKED in 1999, how many hours did this person usually work each WEEK? Usual hours worked each WEEK

- 31** INCOME IN 1999 — Mark ☒ the "Yes" box for each income source received during 1999 and enter the total amount received during 1999 to a maximum of \$999,999. Mark ☒ the "No" box if the income source was not received. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

For income received jointly, report, if possible, the appropriate share for each person; otherwise, report the whole amount for only one person and mark ☒ the "No" box for the other person. If exact amount is not known, please give best estimate.

a. Wages, salary, commissions, bonuses, or tips from all jobs — Report amount before deductions for taxes, bonds, dues, or other items.

- ☐ Yes Annual amount — Dollars

\$, .00

- ☐ No

b. Self-employment income from own nonfarm businesses or farm businesses, including proprietorships and partnerships — Report NET income after business expenses.

- ☐ Yes Annual amount — Dollars

\$, .00

- ☐ Loss

- ☐ No

- 31** c. Interest, dividends, net rental income, royalty income, or income from estates and trusts — Report even small amounts credited to an account.

- ☐ Yes Annual amount — Dollars

\$, .00 ☐ Loss

- ☐ No

d. Social Security or Railroad Retirement

- ☐ Yes Annual amount — Dollars

\$, .00

- ☐ No

e. Supplemental Security Income (SSI)

- ☐ Yes Annual amount — Dollars

\$, .00

- ☐ No

f. Any public assistance or welfare payments from the state or local welfare office

- ☐ Yes Annual amount — Dollars

\$, .00

- ☐ No

g. Retirement, survivor, or disability pensions — Do NOT include Social Security.

- ☐ Yes Annual amount — Dollars

\$, .00

- ☐ No

h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

- ☐ Yes Annual amount — Dollars

\$, .00

- ☐ No

- 32** What was this person's total income in 1999? Add entries in questions 31a—31h; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

Annual amount — Dollars

- ☐ None OR \$, .00 ☐ Loss

- 33** Are there more people living here? If yes, continue with Person 6.

Person

6



**Housing information
helps your community
plan for police and fire
protection.**

1 What is this person's name? *Print the name of Person 6 from page 2.*

Last Name

First Name

MI

2 How is this person related to Person 1? *Mark ☒ ONE box.*

- ☐ Husband/wife
- ☐ Natural-born son/daughter
- ☐ Adopted son/daughter
- ☐ Stepson/stepdaughter
- ☐ Brother/sister
- ☐ Father/mother
- ☐ Grandchild
- ☐ Parent-in-law
- ☐ Son-in-law/daughter-in-law
- ☐ Other relative — *Print exact relationship.*

If NOT RELATED to Person 1:

- ☐ Roomer, boarder
- ☐ Housemate, roommate
- ☐ Unmarried partner
- ☐ Foster child
- ☐ Other nonrelative

3 What is this person's sex? *Mark ☒ ONE box.*

- ☐ Male
- ☐ Female

4 What is this person's age and what is this person's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

NOTE: Please answer BOTH Questions 5 and 6.

5 Is this person Spanish/Hispanic/Latino? *Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.*

- ☐ No, not Spanish/Hispanic/Latino
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, other Spanish/Hispanic/Latino — *Print group.* ↗

6 What is this person's race? *Mark ☒ one or more races to indicate what this person considers himself/herself to be.*

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↗

- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian — *Print race.* ↗
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander — *Print race.* ↗

- ☐ Some other race — *Print race.* ↗

7 What is this person's marital status?

- ☐ Now married
- ☐ Widowed
- ☐ Divorced
- ☐ Separated
- ☐ Never married



a. At any time since February 1, 2000, has this person attended regular school or college? *Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.*

☐ No, has not attended since February 1 → *Skip to 9*

☐ Yes, public school, public college

☐ Yes, private school, private college

- ☐ Nursery school, preschool
- ☐ Kindergarten
- ☐ Grade 1 to grade 4
- ☐ Grade 5 to grade 8
- ☐ Grade 9 to grade 12
- ☐ College undergraduate years (freshman to senior)
- ☐ Graduate or professional school (for example: medical, dental, or law school)

- ☐ No schooling completed
- ☐ Nursery school to 4th grade
- ☐ 5th grade or 6th grade
- ☐ 7th grade or 8th grade
- ☐ 9th grade
- ☐ 10th grade
- ☐ 11th grade
- ☐ 12th grade, **NO DIPLOMA**
- ☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (*for example: GED*)
- ☐ Some college credit, but less than 1 year
- ☐ 1 or more years of college, no degree
- ☐ Associate degree (*for example: AA, AS*)
- ☐ Bachelor's degree (*for example: BA, AB, BS*)
- ☐ Master's degree (*for example: MA, MS, MEng, MEd, MSW, MBA*)
- ☐ Professional degree (*for example: MD, DDS, DVM, LLB, JD*)
- ☐ Doctorate degree (*for example: PhD, EdD*)

☐ Yes

☐ No → *Skip to 12*

☐ Very well

☐ Well

☐ Not well

☐ Not at all

- ☐ Yes, born in the United States → *Skip to 15a*
- ☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
- ☐ Yes, born abroad of American parent or parents
- ☐ Yes, a U.S. citizen by naturalization
- ☐ No, not a citizen of the United States

- ☐ Person is under 5 years old → *Skip to 33*
- ☐ Yes, this house → *Skip to 16*
- ☐ No, outside the United States — *Print name of foreign country, or Puerto Rico, Guam, etc., below; then skip to 16.*

☐ No. different house in the United States

Person 6 (continued)

15 b. Where did this person live 5 years ago?

Name of city, town, or post office

Did this person live inside the limits of the city or town?

- ☐ Yes
☐ No, outside the city/town limits

Name of county

Name of state

ZIP Code

16 Does this person have any of the following long-lasting conditions:

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Blindness, deafness, or a severe vision or hearing impairment? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying? | <input type="checkbox"/> | <input type="checkbox"/> |

17 Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Learning, remembering, or concentrating? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Dressing, bathing, or getting around inside the home? | <input type="checkbox"/> | <input type="checkbox"/> |
| c. (Answer if this person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor's office? | <input type="checkbox"/> | <input type="checkbox"/> |
| d. (Answer if this person is 16 YEARS OLD OR OVER.) Working at a job or business? | <input type="checkbox"/> | <input type="checkbox"/> |

18 Was this person under 15 years of age on April 1, 2000?

- ☐ Yes → Skip to 33
☐ No

19 a. Does this person have any of his/her own grandchildren under the age of 18 living in this house or apartment?

- ☐ Yes
☐ No → Skip to 20a

b. Is this grandparent currently responsible for most of the basic needs of any grandchild(ren) under the age of 18 who live(s) in this house or apartment?

- ☐ Yes
☐ No → Skip to 20a

c. How long has this grandparent been responsible for the(se) grandchild(ren)? If the grandparent is financially responsible for more than one grandchild, answer the question for the grandchild for whom the grandparent has been responsible for the longest period of time.

- ☐ Less than 6 months
☐ 6 to 11 months
☐ 1 or 2 years
☐ 3 or 4 years
☐ 5 years or more

20 a. Has this person ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.

- ☐ Yes, now on active duty
☐ Yes, on active duty in past, but not now
☐ No, training for Reserves or National Guard only → Skip to 21
☐ No, never served in the military → Skip to 21

b. When did this person serve on active duty in the U.S. Armed Forces? Mark (X) a box for EACH period in which this person served.

- ☐ April 1995 or later
☐ August 1990 to March 1995 (including Persian Gulf War)
☐ September 1980 to July 1990
☐ May 1975 to August 1980
☐ Vietnam era (August 1964—April 1975)
☐ February 1955 to July 1964
☐ Korean conflict (June 1950—January 1955)
☐ World War II (September 1940—July 1947)
☐ Some other time

c. In total, how many years of active-duty military service has this person had?

- ☐ Less than 2 years
☐ 2 years or more



Person 6 (continued)

- ☐ 1995 to 2000
- ☐ 1994 or earlier, or never worked → *Skip to 31*

Person 6 (continued)

- 31 c. Interest, dividends, net rental income, royalty income, or income from estates and trusts — Report even small amounts credited to an account.

☐ Yes Annual amount — Dollars
\$ | | | , | | .00 ☐ Loss
☐ No

- d. Social Security or Railroad Retirement

☐ Yes Annual amount — Dollars
\$ | | , | | .00
☐ No

- e. Supplemental Security Income (SSI)

☐ Yes Annual amount — Dollars
\$ | | , | | .00
☐ No

- f. Any public assistance or welfare payments from the state or local welfare office

☐ Yes Annual amount — Dollars
\$ | | , | | .00
☐ No

- g. Retirement, survivor, or disability pensions — Do NOT include Social Security.

☐ Yes Annual amount — Dollars
\$ | | , | | .00
☐ No

- h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

☐ Yes Annual amount — Dollars
\$ | | , | | .00
☐ No

- 32 What was this person's total income in 1999? Add entries in questions 31a—31h; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

Annual amount — Dollars
☐ None OR \$ | | , | | .00 ☐ Loss

- 33 Thank you for completing your official U.S. Census form. If there are more than six people at this address, the Census Bureau may contact you for the same information about these people.

Census 2000 Glossary

Term	Abbrevia- tion	Description
100 percent census edited file	HCEF	A computer file that contains the edited characteristics and records for all households and people in Census 2000. The edits are performed on the 100 percent census unedited file. The edits include consistency edits and imputation for items or people where the data are insufficient for the 100 percent data items from both the short- and long-form questionnaires. The HCEF provided the census counts for apportionment purposes.
100 percent census unedited file	HCUF	The decennial response file was combined with the decennial master address file to create the HCUF and sample census unedited file. The HCUF contains the unedited individual responses to the 100 percent data items from both the Census 2000 short- and long-form questionnaires.
100 percent data		Population and housing information collected for all living quarters in the United States. See long form, sample data, short form.
100 percent detail file	HDF	A file resulting from the application of disclosure avoidance and tabulation geography to the 100 percent census edited file. This file was used to produce Census 2000 data products and other tabulations based on the 100 percent items.
A Streamlined Acquisition Process	ASAP	The Census Bureau process to acquire services. There are six phases: (1) bureau integrated strategic planning and budgeting, (2) project planning, (3) market research, (4) selection acquisition vehicle, (5) meet project objective and manage acquisition, and (6) closeout.
Accuracy and Coverage Evaluation	A.C.E.	A coverage measurement methodology used to determine the number of people and housing units missed or counted more than once in Census 2000.
active entity		A governmental unit that has elected or appointed officials who carry out legally prescribed functions, provide services, and/or raise revenues. The Census Bureau differentiates active entities by their fiscal independence and whether they provide general or limited special services. See functional status, functioning entity, governmental unit, inactive entity, nonfunctioning entity.
address		The house number and street name or other designation assigned to a housing unit, special place, business establishment, or other structure for purposes of mail delivery or to allow emergency services, delivery people, and visitors to find the structure. See basic street address, city-style address, E-911 address, fire number, house number and street name address, location description, mailing address, non-city-style address.
address break		The city-style address on each side of a legal boundary; for example, 1234 Main Street is inside an incorporated place and 1236 is outside the place.
address coding guide	ACG	A forerunner of the Geographic Base File/Dual Independent Map Encoding file and TIGER® file.

Term	Abbreviation	Description
address control file	ACF	The 1990 residential address list used to label questionnaires, control the mail response check-in operation, and determine the nonresponse follow-up workload. See master address file.
Address List Review Program and Address List Map Review Program	ALR ALMR	Also called Local Update of Census Addresses. Census 2000 programs, established in response to requirements of Public Law 103-430, that provided an opportunity for local and tribal governments to review and update individual address information in the master address file and associated geographic information in the TIGER® database to improve the completeness and accuracy of both computer files. The governments signed a confidentiality agreement to participate.
address listing	AL	A field operation to develop the Census 2000 address list in areas of predominantly non-city-style addresses. The lister enters, in an address register, all mailing addresses and/or physical locations for all places within a specified area. The lister marks the location of each residential structure on an assignment area block map by drawing a map spot and assigning a map spot number. The lister also updates and corrects the map if necessary.
address range		The lowest and highest house numbers along each side of a street segment that has city-style addresses. The U.S. Census Bureau usually expands the range to include all possible numbers, not just the existing ones (for example, the Census Bureau expands the actual addresses of 105–131 on the odd-numbered side of the 100 block of a street to 101–199). Usually an address range on one side of a street contains only even or only odd numbers, but sometimes one or both sides contain both.
address register	AR	A book used by field staff to record or verify addresses and related information for all living quarters in an assignment area. It also includes: (1) instructions on how to perform the job and (2) a set of maps for the assigned area.
address register area	ARA	Term used in 1990. Now called an assignment area.
addressable feature		A physical feature along which living quarters can be constructed and assigned an address. Usually, this is a road or street, but it could also be an alley, driveway, and occasionally an unusual feature such as a railroad track or navigable stream.
Advance Census Report	ACR	In previous censuses, an unaddressed, short-form questionnaire delivered by U.S. Postal Service letter carriers in advance of the actual enumeration in list/enumerate areas. Enumerators picked up any completed ACRs, checked them for completeness and consistency, transferred the responses to standard census questionnaires, and completed any missing information. Used only in the Island Areas for Census 2000.
advance notice letter/reminder card	ANL/RC	Part of the questionnaire mailing strategy. ANL: In every area except list/enumerate, the Census Bureau sends an advance notice letter to every mailout address to alert households that the census form will be sent soon. RC: A postcard sent to addresses on the decennial master address file to remind respondents to return their census questionnaires or to thank them if they already have. All addresses in mailout/mailback areas receive a postcard. The Census Bureau blanket-mails these postcards to postal patrons (no addresses) in update/leave areas.
Advance Post Office Check	APOC	Obsolete term. See postal validation check.

Term	Abbreviation	Description
Alaska Native Claims Settlement Act	ANCSA	Legislation (Public Law 92-203) enacted in 1972 establishing the Alaska Native Regional Corporations and Alaska Native Villages to conduct business and nonprofit activities by and for Alaska Natives.
Alaska Native Regional Corporation	ANRC	A corporate entity organized to conduct both business and nonprofit affairs of Alaska Natives pursuant to the Alaska Native Claims Settlement Act.
Alaska Native Village	ANV	A type of local governmental unit in Alaska that constitutes an association, band, clan, community, group, tribe, or village recognized pursuant to the Alaska Native Claims Settlement Act. ANVs do not have legally defined boundaries. See Alaska Native Village statistical area, governmental unit, legal entity.
Alaska Native Village statistical area	ANVSA	A decennial census statistical area that represents the geographic jurisdiction of an Alaska Native Village (ANV) as established for the Census Bureau by officials of the ANV and its Alaska Native Regional Corporation for the purpose of presenting census data.
American Community Survey	ACS	A monthly sample household survey similar to the long-form census questionnaire. It was first tested in 1996 and is expected to replace the long form for the 2010 Census. Beginning in 2003, the nationwide monthly sample survey provides annual data for social, economic, and housing characteristics. At first, the data will be available for states, cities, counties, and metropolitan areas with a minimum population of 250,000; then, in 2004, a minimum population of 65,000; and in 2008, small geographic entities.
American FactFinder	AFF	A generalized electronic system for access and dissemination of Census Bureau data. The system is available through the Internet and offers prepackaged data products and the ability to build custom products. The system serves as the vehicle for accessing and disseminating data from Census 2000 (as well as the 1997 Economic Censuses and the American Community Survey). The system was formerly known as the Data Access and Dissemination System (DADS).
American Indian and Alaska Native area	AIANA	A Census Bureau term referring to these entity types: American Indian reservation, American Indian subreservation area, American Indian trust lands, state designated American Indian statistical area, tribal jurisdictional statistical area, tribal designated statistical area, tribal subdivision, Alaska Native Regional Corporation, Alaska Native Village, or Alaska Native Village statistical area.
American Indian area	AIA	A generic Census Bureau grouping that includes reference to any or all of the following areas: American Indian reservation, American Indian trust lands, tribal jurisdiction statistical area, or tribal designated statistical area.
American Indian area/Alaska Native area/Hawaiian Home Lands	AIANHH	An all-encompassing Census Bureau term referring to American Indian entities, Alaska Native entities, and Hawaiian Home Lands. See American Indian and Alaska Native area, Hawaiian Home Lands.
American Indian reservation		An American Indian geographic entity with boundaries established by treaty, statute, or executive or court order. Federal and some state governments have established reservations as territory over which American Indians have governmental jurisdiction. These entities are designated as colonies, communities, pueblos, rancherias, reservations, and reserves. See American Indian and Alaska Native area, governmental unit, legal entity.

Term	Abbreviation	Description
American Indian tribal subdivision		An administrative subdivision of an American Indian reservation. Tribal subdivisions may extend beyond the boundary of their reservations. These entities are internal units of self-government or administration that serve social, cultural, or economic purposes for the American Indians living on and adjacent to the reservation.
American Indian trust land	TL	Land held in trust by the federal government for either a tribe (tribal trust land) or an individual member of a tribe (individual trust land). Such land always is associated with a specific federally recognized reservation or tribe but may be located on or off the reservation. The Census Bureau recognizes and tabulates data separately only for off-reservation trust lands. See American Indian reservation, Hawaiian Home Lands.
apportionment		The number of representatives that a state is entitled to in the U.S. House of Representatives based on the decennial census. See reapportionment, redistricting.
assignment area	AA	A geographic area established by the Census Bureau for a specific field operation for the census. An AA consists of one or more census blocks for most operations and is assigned to a single enumerator, lister, or other field staff to obtain information about the residents and living quarters within the boundaries of the AA. Formerly called an address register area and an enumeration district. See assignment area map, collection geography.
assignment area map	AA map	A map that shows the area assigned to a member of the field staff for a specific census operation. The map displays the individual roads, streets, and nonstreet features (and their names, if any) in and adjacent to the assignment area (AA), and, if appropriate, the city-style address ranges of the roads and streets or the census collection block numbers within the AA. See assignment area, block map, collection block, locator map.
assignment control		For all field operations, clerks check the accuracy and completeness of work returned from the field to the local census office. This procedure takes on critical importance for nonresponse follow-up and list/enumerate.
assignment preparation		The coordination, preparation, and assembly of all materials, including maps, registers, and questionnaires, by assignment area. This operation is performed at the regional census centers for address listing and block canvassing and at the local census offices for other field operations. Map pouch labels and maps are printed in the regional census centers.
Asynchronous Transfer Mode	ATM	A process that increases the amount of information that can be electronically transferred at one time between sites.
Automated Address Range Program	AARP	A program for achieving consistent address/block number relationships between field-verified residential addresses in the master address file and address ranges in the TIGER® database.
automated data processing	ADP	The data processing operations performed by a system of electronic or electrical machines.
Automated Master Address File Geocoding Office Resolution	AMAF-GOR	A computer match that attempts to geocode city-style addresses in the master address file after street features, names, address ranges, and ZIP Code information have been inserted into the TIGER® database from digital files from a local government or commercial source. See Boundary and Annexation Survey, census map preview, digital exchange file, geocode, TIGER®, TIGER® Improvement Program, and targeted map update.

Term	Abbreviation	Description
bar code		A code consisting of a group of printed and patterned bars designed to be scanned and read into computer memory.
barrio		A legal subdivision of a municipio in Puerto Rico, treated as a minor civil division by the Census Bureau. See barrio-pueblo, county subdivision, legal entity, minor civil division.
barrio-pueblo		A legal subdivision of a municipio in Puerto Rico, treated as a minor civil division by the Census Bureau. The barrio-pueblo is differentiated from other barrios because it is the historical center and seat of government of its municipio. See barrio, county subdivision, legal entity, minor civil division.
basic street address	BSA	The house number and street name portion of an address, such as 11 Main Street. The BSA does not include designations for apartments, units, lots, and the like. However, when the address for a specific structure is identified by a number followed by a fraction or letter, such as 11½, or 11A, the fraction or letter is part of the BSA. See address, city-style address, house number and street name address, mailing address.
Be Counted enumeration and Be Counted form	BC/BCF	Includes the Be Counted enumeration procedure and the Be Counted form. The enumeration procedure targets areas that are traditionally undercounted. Unaddressed census questionnaires (Be Counted forms) are placed at selected sites where people who believe they were not counted can pick them up, complete them, and mail them to the Census Bureau. The sites are in targeted areas that local governments and community groups, in conjunction with the Census Bureau, identified as traditionally undercounted.
Be Counted field verification		This operation verifies the existence and the residential status of addresses given to the Census Bureau through the Be Counted program. Any address that is verified is added to the master address file.
best and final offer	BAFO	The final and best technical and price solution a vendor provides for a request for proposal in response to a call from the government contracting officer.
beta site		Located at headquarters, the beta site is an independent operation to test and assure quality, completeness, and security of software systems, hardware systems, and network systems before release to a production environment.
beta testing		Ensures that the hardware, software, and communication components are functioning properly before release to the various decennial operating units.
blanket mailing		There are two definitions for this term: (1) The mailing to all postal patrons (no addresses) of reminder cards or other forms. (2) A strategy that was considered but not implemented for Census 2000: the mailing of replacement questionnaires to either all addresses or all addresses in areas with anticipated low response rates.
block		A geographic area bounded on all sides by visible or non-visible features shown on census maps. A block is the smallest geographic entity for which the Census Bureau collects and tabulates decennial census information. See block boundary, block number, collection block, statistical entity, or tabulation block.

Term	Abbreviation	Description
block boundary		A census map feature, visible (street, road, stream, shoreline, and so forth) or nonvisible (county line, city limit, property line, and so forth), that delimits a census block. Two or more features usually delimit a block, but a single feature may delimit a block in the case of an island or a circular street. A boundary generally must include at least one addressable feature, that is, a feature that can have an address assigned to it. The boundary of a state or county is always a block boundary.
Block Boundary Suggestion Project	BBSP	The first phase of the Census Bureau's Public Law 94-171 program that provides an opportunity for states to suggest visible features, such as block boundaries, that are or may be voting district boundaries for the decennial census.
block canvassing		A Census 2000 field operation that ensures the quality of the master address file within the mailout/mailback area (city-style addresses). The Census Bureau sends canvassers into the field to canvass their assignment areas and ensure that the master address file contains a mailing address for every living quarters. They especially seek hidden housing units, such as attics, basements, or garages converted into housing units, or houses that appear to be one unit but which actually contain multiple housing units. They also update and correct the census maps. Formerly called prec canvass and targeted canvassing. See blue line and canvass.
block cluster		A single block or a group of blocks, varying in size.
Block Definition Project	BDP	A program similar to the Block Boundary Suggestion Project. It applies only to American Indian reservations and Puerto Rico.
block group	BG	A combination of census blocks that is a statistical subdivision of a census tract. Geographic block groups never cross census tracts but may cross the boundaries of county subdivisions, places, urbanized areas, voting districts, and so forth. Tabulation block groups may be split to present data for every unique combination of county subdivision, place, and the like.
block locator map		A Census Bureau map that displays a census block—usually a collection block—and a substantial amount of surrounding area, to help field staff identify where the block is located and determine an efficient route of travel to the block. See collection block, locator map.
block map		A large scale map of an individual census collection block showing the individual roads, streets, and other features, together with their names (if any) within and adjacent to the block. Field staff use block maps to guide them in their canvass of each block, to annotate map changes, and to mark (map spot) and number the location of each residential structure. See assignment area map, block number, collection block, and map spot.

Term	Abbreviation	Description
block number		<p>A number assigned to each census block.</p> <ul style="list-style-type: none"> For collecting information for Census 2000, each census block was identified uniquely within a county (or statistically equivalent entity) by a 4- or 5-digit number. All the collection blocks in a county used the same number of digits. As a result of changes to the TIGER® database after the Census Bureau had numbered the blocks in preparation for Census 2000 field operations, the number could have an alphabetic suffix, to represent one portion of a physical block that was split by an added street or road or by the addition or change of the boundary of a county, American Indian reservation, off-reservation trust land, or military installation; e.g., if an added street bisected Block 1005, the block was split into Blocks 1005A and 1005B to represent the portion of the original collection block on each side of that street. For tabulating data for Census 2000, each census block was identified uniquely within a census tract by a 4-digit number. A 1990 census block number had three digits and might include an alphabetic suffix. The first digit of a tabulation block number identified the block group in which the census block was located.
block numbering area	BNA	Small statistical subdivisions of a county for grouping and numbering blocks in nonmetropolitan counties where local committees of census data users have not established census tracts. For Census 2000, the agency combined the census tract and block numbering area programs into a single program; the resulting geographic entity was called a census tract.
blue line		A boundary defining the area included in mailout/mailback. Essentially, these are areas that have city delivery of mail.
boarded up		A housing condition in which the doors or windows of a building have been covered to prevent destruction or entry.
borough		A county equivalent in Alaska, a minor civil division in New York, and an incorporated place in Connecticut, New Jersey, and Pennsylvania. See governmental unit.
boundary		A line identifying the extent of a geographic entity, such as a block, census tract, county, or place. The legal boundaries the Census Bureau recognizes for a census are those in place on the first day of the census year.
Boundary and Annexation Survey	BAS	An annual survey of all incorporated places and all counties conducted by the Census Bureau to determine the correct legal limits and related information as of January 1 of the survey year. See Automated Master Address File Geocoding Office Operation, census map preview, targeted map update, TIGER®, and TIGER® Improvement Program.

Term	Abbreviation	Description
boundary change		The establishment, relocation, or deletion of a boundary. For legal entities, boundary changes are reported to the Census Bureau in a state, local, or tribal government's response to a Boundary and Annexation Survey; through a periodic survey to collect boundary information for a specific set of geographic entities; as an adjunct to obtaining other information about an area (such as updated street pattern or address information); or by some other reliable source. For statistical entities, boundary changes are provided in preparation for a specific census in response to the Census Bureau's Participant Statistical Areas Program or some other specific boundary collection program. The boundaries of legal entities are changed due to legal actions, whereas statistical entities may be changed by appropriate reviewers to reflect population growth or decline, or because of revisions either to visible or legal features used as boundaries or to Census Bureau procedures. A boundary change also can occur due to an error in recording a boundary for one census or survey and showing it correctly for the next one.
building		Usually a separate structure that has open space on all sides. Townhouses are separate buildings. Some buildings can be used both as a residence and a business, as in the case of an apartment located above a grocery store.
Bureau of Economic Analysis	BEA	Department of Commerce. The BEA's goal is to provide a clear picture of the U.S. economy by preparing, developing, and interpreting the national income and product accounts (summarized by the gross domestic product) as well as aggregate measures of international, regional, and state economic activity.
Bureau of Labor Statistics	BLS	Department of Labor. The BLS is the principal fact-finding agency for the federal government in the broad field of labor economics and statistics.
callback		Repeat telephone calls an enumerator makes to a living quarters to obtain information.
callback record page		A page in an address register used to record information about each callback an enumerator makes to a living quarters to obtain information.
canvass		To systematically travel, block by block, every street, road, path, and the like in an assignment area, identifying every place where people live or could live.
casing check		See postal validation check.
census		A complete enumeration of a population or the business and commercial establishments, farms, or governments in an area. See decennial census.
Census 2000 Committee on Statistical Policy	CCSP	Composed of policy makers and technicians who provided external review and advice. The group reviewed policy matters as they affected decisions about statistical methods to be used.
Census 2000 library		A depository of key Census 2000 documents using an electronic document tracking system. See Personal Computer Document Organization and Control System.
Census 2000 Publicity Office	C2PO	Census Bureau. Developed, implemented, and coordinated an integrated marketing program for Census 2000, including paid advertising, direct mail, public relations, partnerships, and local outreach.
Census Address List Improvement Act of 1994		See Public Law 103-430.

Term	Abbrevia- tion	Description
Census Advisory Committee	CAC	Several advisory committees counseled the Census Bureau on matters relating to Census 2000. The Commerce Secretary's 2000 Census Advisory Committee was composed of representatives of organizations interested in and knowledgeable about the decennial census. The Census Advisory Committee of Professional Associations consisted of nine representatives from each of the following organizations: the American Economic Association, the American Marketing Association, the American Statistical Association, and the Population Association of America. Five race and ethnic advisory committees informed the Census Bureau on matters relating to their communities' participation in the decennial census and uses of census products. These committees represented the following race and ethnic groups: African Americans, American Indians and Alaska Natives, Asians, Hispanics, and Native Hawaiians and Other Pacific Islanders.
census area		The statistical equivalent of a county in Alaska. Census areas are delineated cooperatively with the State of Alaska for statistical purposes in the portions of Alaska not within an organized borough.
census block		See block.
census block map		A map showing the numbered census blocks and appropriate higher-level census geography within a geographic entity or area. A census block map usually consists of multiple map sheets. See block map, Census Bureau map.
Census Bureau	CB	Department of Commerce. The Census Bureau is the country's preeminent statistical collection and dissemination agency. It publishes a wide variety of statistical data about people and the economy of the nation. The Census Bureau conducts approximately 200 annual surveys and conducts the decennial census of the U.S. population and the quinquennial census of industry.
Census Bureau map		Any map, in electronic or paper form, produced by the Census Bureau. Such a map usually displays the boundaries and names and/or codes of the geographic entities that the Census Bureau uses to take a census or survey, or for which the Census Bureau tabulates data, and may include both visible and invisible features, feature names, and other information appropriate to the purpose for which the map was prepared. Some Census Bureau maps display statistical data in various thematic forms. Every Census Bureau map displays a credit note showing that it was produced by the U.S. Census Bureau. May be referred to as "census map" after first usage of the term.
census code		A code assigned by the Census Bureau to identify a specific geographic entity. The Census Bureau uses census codes for geographic entities for which a federal information processing standards code either does not exist or is inadequate to identify and/or sequence a type of entity. See federal information processing standards code, geographic code.
census county division	CCD	A subdivision of a county that is a relatively permanent statistical area established cooperatively by the Census Bureau and local government authorities. Used for presenting decennial census statistics in those states that do not have well-defined and stable minor civil divisions that serve as local governments.
Census Day		The reference date for collection of census information. For the decennial census, this has been April 1 of the decade year (year ending with zero) since the 1930 census.

Term	Abbreviation	Description
census designated place	CDP	A statistical entity comprising a dense concentration of population that is not within an incorporated place but is locally identified by a name. CDPs are delineated cooperatively with state, local, and tribal government officials based on Census Bureau guidelines. For the first time in Census 2000, CDPs did not have to meet a population threshold to qualify for tabulation of census data. See comunidad, place, statistical entity, zona urbana.
census division		See division (census geographic).
census edited file	CEF	This file contains the 100 percent edited characteristics/records for all households and persons in the census. The edits include consistency edits and imputation for items or persons where the data are insufficient. See 100 percent data, census unedited file.
census feature class code	CFCC	A 3- or 4-character alphanumeric code assigned to the various features (points, lines, polygons, and key geographic locations) in the TIGER® database to uniquely identify the basic characteristics of each feature. Only landmarks use 4-character CFCCs, which appear only in the Geography Division's internal files.
census field office	CFO	A temporary Census Bureau office established in Census 2000 to manage address listing field work, conduct local recruiting, and create a local presence.
census geography		A collective term referring to the geographic entities used by the Census Bureau for data collection and tabulation. There is collection geography and tabulation geography.
census identification number		A number associating a response with a specific address in the master address file.
census map		Any map produced by the Census Bureau. A census map displays geographic entities used in a Census Bureau census or survey for which the Census Bureau tabulates data.
census map preview		A Census 2000 program that asked local government officials to review census maps. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, targeted map update, TIGER®, and TIGER® Improvement Program.
Census Monitoring Board		Established by public law, the function of the board was "to observe and monitor all aspects of the preparation and implementation of the 2000 decennial census (including all dress rehearsals and other simulations of a census in preparation therefore)." The board ceased to exist on September 30, 2001.
census region		See region (census geographic).
census statistical areas committee	CSAC	A committee established by local government officials and other interested individuals to identify, in cooperation with the Census Bureau, the census tracts, block groups, census designated places, and other statistical entities for the area it serves.
census statistical areas key person	CSAKP	A person designated by a census statistical areas committee to act as its contact person with the Census Bureau.
census subarea		Statistical subdivisions of boroughs and census areas (county equivalents) in Alaska.
census tract		See tract.
census tract number		See tract number.

Term	Abbreviation	Description
census unedited file	CUF	A file created by merging the control file for the decennial master address file with the decennial response file of unedited data after the primary selection algorithm has been applied. This file contains the final housing unit and person counts. It is used to generate apportionment data as well as related “raw” or unedited census data.
central city		In a metropolitan area (MA), the largest place and, in some areas, one or more additional places that meet official standards issued by the federal Office of Management and Budget. If a place extends beyond an MA, only the portion within the MA is a central city. A few primary metropolitan statistical areas do not have a central city.
central county		A core county (or statistically equivalent entity) of a metropolitan area (MA). Such a county includes at least half the population of a central city of the MA, provided the central city is located in an urbanized area related to the MA, or at least half the population of the related urbanized area(s) in the county. All other counties (or statistically equivalent entities) in an MA are “outlying counties.” MAs in New England do not have a central county.
central place		In an urban area (urbanized area or urban cluster), the largest place and, in some areas, one or more additional places that meet specific Census Bureau criteria. If a place is identified as an extended place, only the portion within the urban area represents the central place. For an urban area that does not contain an incorporated or census designated place, there is no central place; the title of the urbanized area or urban cluster uses the name of a minor civil division, or a local place name recognized by the Board on Geographic Names and recorded by the U.S. Geological Survey, but the name does not represent a central place.
city		A type of incorporated place in all states and the District of Columbia. In agreement with the State of Hawaii, however, the Census Bureau does not recognize the city of Honolulu for presentation of decennial census data. In Virginia, all cities are not part of any county, and the Census Bureau treats them as county equivalents as well as places for purposes of data presentation; there also is one such independent city in each of three states: Maryland, Missouri, and Nevada. In 20 states, some or all cities are not part of any minor civil division, and the Census Bureau treats them as county subdivisions for purposes of data presentation. See county equivalent, county subdivision, governmental unit, incorporated place, and independent city.
city delivery area		An area (1) in which post offices deliver mail to addresses consisting of a house number and street name AND (2) which consists of city delivery routes as designated by the U.S. Postal Service. Some homes and establishments in a city delivery area may choose to use a post office/drawer or general delivery for their mail. See city-style address, nondelivery area, rural delivery area.
city-style address		An address that consists of a house number and street name; for example, 201 Main Street. The address may or may not be used for the delivery of mail and may include apartment numbers/designations or similar identifiers. See address, basic street address, house number and street name address, mailing address, noncity-style address.

Term	Abbreviation	Description
cluster		A range of house number and street name addresses that contains one or more addresses that were not geocoded to a census block. Lists of such address ranges ("cluster lists") were used for Master Address File Geocoding Office Resolution, the TIGER® Improvement Program, and targeted map update, to identify for resolution those address ranges for which the Census Bureau had received one or more addresses that it could not match to a specific location in the TIGER® database.
coefficient of variation	CV	The ratio of the standard error (square root of the variance) to the value being estimated, usually expressed in terms of a percentage (also known as the relative standard deviation). The lower the CV, the higher the relative reliability of the estimate.
collection block		A physical block enumerated as a single geographic area, regardless of any legal or statistical boundaries passing through it. (Except the state and county boundaries are always block boundaries.) See block, block number, tabulation block.
collection geography		The geographic entities used by the Census Bureau for taking a census. For Census 2000, a census field office or local census office/crew leader district/assignment area collection block identified a unique geographic area. See tabulation geography.
Commerce Administrative Management System	CAMS	A system integrating financial and related subsystems for management and administration.
<i>Commerce Business Daily</i>	CBD	A newspaper published by the Department of Commerce in which all procurement notices and awards in the federal government are listed.
commercially available off-the-shelf software/ commercial off-the-shelf software	COTS	Software that may be purchased and implemented for a particular application with minimal or no modification required.
Commonwealth		The legal designation for four states (Kentucky, Massachusetts, Pennsylvania, and Virginia) and two Island Areas (Puerto Rico and the Northern Mariana Islands). The Census Bureau does not use this term in presenting data.
comunidad		A census designated place in Puerto Rico. See census designated place, zona urbana.
compact disk-read only memory	CD-ROM	An optical disk that is created by a mastering process and used for storing large amounts of data. Unlike standard computer disks and diskettes, CD-ROMs can be used only to read stored data, not to update or change its content.
Complete Count Committee	CCC	A volunteer committee established by local, and sometimes state, governments and comprised of a cross-section of community leaders, including representatives from government, education, business, religious organizations, community agencies, minority organizations, and the media. These committees were charged with developing and implementing a Census 2000 outreach, promotion, recruiting, and enumeration assistance plan of action designed to target and address the needs of their community.
computer-assisted personal interview	CAPI	A method of data collection consisting of the interviewer asking questions displayed on a laptop computer screen and entering the answers directly into the computer.
Computer Assisted Survey Research Office	CASRO	Census Bureau. Provides automation and telecommunication technologies to improve the collection, processing, and dissemination of data.

Term	Abbreviation	Description
computer-assisted telephone interviewing	CATI	A method of data collection using telephone interviews in which the questions to be asked are displayed on a computer screen and responses are entered directly into the computer.
concept of operations	CONOPS	The Department of Commerce's reengineered acquisition process.
confidentiality		The guarantee made by law (Title 13, U.S. Code) to individuals who provide census information regarding nondisclosure of that information to others. See Privacy Act, special sworn status individual.
confidentiality edit		The name for the Census 2000 disclosure avoidance procedure.
Congressional Affairs Office	CAO	Census Bureau. Acts as a liaison between Congress and the Census Bureau.
congressional district	CD	An area established by law for the election of representatives to the U.S. Congress. Each CD is to be as equal in population to all other CDs in the state as practicable, based on the decennial census counts.
consolidated city		An incorporated place that has combined its governmental functions with a county or county subdivision but contains one or more other incorporated places that continue to function as local governments within the consolidated government. See consolidated government, incorporated place, legal entity.
consolidated government		A governmental unit that includes two or more legal entities that have joined together to form a common government; for example, a consolidated city-county government.
consolidated metropolitan statistical area	CMSA	A geographic entity designated by the federal Office of Management and Budget for use by federal statistical agencies. An area becomes a CMSA if it qualifies as a metropolitan statistical area (MSA), has a population of 1 million or more, and has component parts that qualify as primary metropolitan statistical areas, provided local opinion favors the designation. CMSAs consist of whole counties except for the New England states, where they consist of cities and towns.
content edit		An operation including a review of questionnaires for missed answers or multiple entries. The edits are designed to improve data quality and reduce item nonresponse.
continuous measurement	CM	Census data is collected once every 10 years. To provide a stream of data between decennial censuses, the Census Bureau has instituted the American Community Survey.
conventional census		See list/enumerate.
Cost and Progress System for Census 2000	C&P	Refers to both the system and the reports generated by the system. The C&P system was a component of the management information system that reported on the cost and progress of address list development and data collection, capture, processing, and dissemination for Census 2000. See Enterprise Information System.
count question resolution	CQR	A process whereby state, local, and tribal government officials could obtain answers to their concerns about the accuracy and completeness of the Census 2000 counts.

Term	Abbreviation	Description
county		A type of governmental unit that is the primary legal subdivision of every state except Alaska and Louisiana (boroughs and parishes, respectively). The Island Areas also do not have counties as their primary legal subdivision (county is a minor civil division in American Samoa). See county equivalent, governmental unit.
county equivalent		A geographic entity that is not legally referred to as a county but is recognized by the Census Bureau as equivalent to a county for purposes of data presentation. Because they contain no county-type subdivision, the Census Bureau treats the District of Columbia and Guam as county equivalents (as well as state equivalents). See also borough, census area, independent city, municipio, parish.
county subdivision		A legal or statistical division of a county recognized by the Census Bureau for data presentation. See barrio, barrio-pueblo, borough, census county division, county subarea, city, minor civil division, town, unorganized territory, village. Also see legal entity, statistical entity.
coverage edit/coverage edit follow-up	CEFU	An edit performed on the mailback census response universe. Staff make telephone calls to resolve forms that are incomplete or have other coverage discrepancies, such as a difference between the number of persons reported in that household and the number of persons for whom census information was provided on the form. This edit includes the large household follow-up.
coverage improvement follow-up	CIFU	A procedure for the traditional census in which housing units with conflicting status information are followed up.
crew leader	CL	The immediate supervisor of a team of listers, enumerators, or other field staff for a decennial census. See crew leader district, field operations supervisor.
crew leader district	CLD	The district area assigned to a crew leader, formed by grouping together a number of enumerator assignment areas.
crews of vessels		The shipboard populations of U.S. Navy, U.S. Coast Guard, and merchant marine vessels. For geographic purposes, they are assigned to the offshore area adjacent to their home port.
Customer Liaison Office	CLO	Census Bureau. The CLO is the point of contact between the Census Bureau and its external customers, both public and private. The external customers include government organizations, such as the state data centers, business and industry data centers, census information centers, governors' liaisons for Census 2000, and tribal governmental leaders, and nongovernment entities, such as the national labor unions and national nonprofit organizations.
dangerous settlements		Compounds where listers have encountered dangerous situations, such as militia groups. The listers are instructed to note the living quarters as a special place and to not interview. Though listed as a special place, special place operations are not conducted at these living quarters. Procedures for listing and enumerating these settlements include interviewing the local postmaster and public officials.
Data Access and Dissemination System	DADS	Now called the American FactFinder.
data capture audit resolution	DCAR	An edit and review on response records. An edit compares a derived count of persons to the questionnaire count. Edit failures may be resolved in-house or referred to coverage follow-up.

Term	Abbreviation	Description
data capture center	DCC	A decentralized facility that checks in questionnaires returned by mail, creates images of all questionnaire pages, and converts data to computer-readable format. The DCCs also perform other computer-processing activities, including automated questionnaire edits, work flow management, and data storage. There is one permanent DCC, the National Processing Center. For Census 2000, the Census Bureau set up three temporary DCCs. The temporary facilities were provided and operated by a private contractor through the data capture services contract.
Data Capture Management Information System	DMIS	A computerized management information system developed for use in the data capture centers. It provides automated tools to facilitate and support the management of the centers.
data capture services contract	DCSC	The contract that provides the facilities for data capture center operations and services.
Data Capture System 2000	DCS 2000	The data capture system that was used to capture information from census forms. This system incorporated the following activities: processing more than 120 million incoming forms; digitally capturing and processing billions of bits of information on the forms; converting automatically the image of the form to text-based data; and editing/repairing data that the system was unable to decipher automatically.
Data Preparation Division	DPD	Now called the National Processing Center.
Decennial Applicant Name Check	DANC	An automated system used to screen all applicants' backgrounds for criminal histories to facilitate the selection, hiring, promotion, and payrolling of qualified and suitable applicants for the conduct of Census 2000.
decennial census		The census of population and housing, taken in each year ending in zero. Article 1, Section 2 of the Constitution requires that a census be taken every 10 years for the purpose of apportioning the U.S. House of Representatives. The first census of population was taken in 1790. The Census Bureau first conducted the census of housing in 1940.
Decennial Cost Model	DCM	The primary tool for documenting and analyzing budgetary resources needed to support program requirements. It contains assumptions and parameters used to describe and analyze the budget components.
decennial field interface	DFI	The collection of systems used in the regional census centers, the census field offices, and the local census offices to control and manage the census data collection effort. It includes, among others, the operations control, payroll and personnel, map production, and management information systems.
Decennial Management Division	DMD	Census Bureau. The DMD directs and monitors the decennial census. It coordinates and provides project management for all census operations; maintains the master activity schedule, the Cost and Progress System, the Executive Information System, and the Decennial Cost Model; manages the decennial budget; manages decennial communications, issue resolution change control, and requirements documentation; and directs development of the census plan.

Term	Abbreviation	Description
decennial master address file	DMAF	Had features for controlling and tracking the long- and short-term operations and programs of Census 2000. Contained the processing status information to support document mailouts; data capture progress control, tracking, and reporting; and field enumeration processes (notably follow-ups). The base file for sampling housing units for programs, such as long-form implementation. Limited to addresses that the Census Bureau successfully linked to the TIGER® database. See master address file.
decennial response file	DRF	Contains every response to the census from all sources. The primary selection algorithm is applied to this file to unduplicate persons between multiple returns for a housing unit and to determine the housing unit record and the persons to include at the housing unit. The DRF is then combined with the decennial master address file to create the census unedited file.
Decennial Statistical Studies Division	DSSD	Census Bureau. Develops mathematical and statistical techniques for the design and conduct of the census.
Decennial Systems and Contracts Management Office	DSCMO	Census Bureau. Developed and managed major Census 2000 contracts to process Census 2000 data and disseminate data to the public.
delete		The status for an address in the master address file that no longer qualifies as a living quarters.
delivery sequence file	DSF	A computerized file containing all delivery point addresses serviced by the U.S. Postal Service (USPS). The USPS updates the DSF continuously as its letter carriers identify addresses for new delivery points or changes in the status of existing addresses.
demographic analysis	DA	An independent, macro-level approach to validate the census results. Estimates using demographic analysis are based on aggregate sets of administrative data, including birth and death records, immigration statistics, and Medicare data.
digital exchange file		An electronic file of roads and streets, their names, address ranges, and ZIP Codes obtained from a local government or commercial source and used to update TIGER®.
digital line graph		Digital information derived by the U.S. Geological Survey from its maps.
direct access		An entrance to a living quarters directly from the outside of the building or through a common or public hall (as in an apartment building).
direct sample follow-up		A methodology for nonresponse follow-up sampling whereby the initial response period stops at a specified date and a sample is selected from all remaining nonresponding units.
Director		Census Bureau. Determines policies and directs the programs of the Census Bureau, taking into account applicable legislative requirements and the needs of users of statistical information.
disclosure avoidance	DA	Statistical methods used in the tabulation of data prior to releasing data products to ensure the confidentiality of responses.
district office	DO	A pre-Census 2000 term for local offices established by the Census Bureau to conduct the decennial census. See census field office, local census office.

Term	Abbreviation	Description
division (census geographic)		A grouping of states within a census geographic region, established by the Census Bureau for the presentation of census data. The nine divisions (East North Central, East South Central, Middle Atlantic, Mountain, New England, Pacific, South Atlantic, West North Central, and West South Central) are intended to represent relatively homogeneous areas that are subdivisions of the four census geographic regions.
dress rehearsal	DR	A census of population and housing conducted in selected areas prior to a decennial census to determine the effectiveness of planned census operations. The Census 2000 Dress Rehearsal was conducted in 1998 in Sacramento, California; Menominee County, Wisconsin, including the Menominee American Indian reservation; and 11 counties in South Carolina, including the city of Columbia.
Dual Independent Map Encoding	DIME	Term used in the 1990 census. See Geographic Base File/Dual Independent Map Encoding.
dual system estimation	DSE	The estimation methodology used for the Accuracy and Coverage Evaluation (A.C.E.). This operation uses a geographic sample of block clusters to find persons missed by the census or A.C.E. and any errors from the census. The persons from the unedited census files are computer matched and then clerically matched to the data collected from the A.C.E. interviews. After the computer matching, the person matching continues through the following steps: clerical matching, field follow-up to resolve discrepancies, and a final clerical matching.
E-Sample		In the Census 2000 Accuracy and Coverage Evaluation (A.C.E.) program, the E-sample consisted of people enumerated in the census in the A.C.E. sample block clusters.
E-911 address		A number, usually unique within a county, posted on or near a structure, especially in rural areas, for use by emergency personnel to locate the structure. An E-911 address is a house number and street name address, which may or may not be used for mail delivery.
early opening local census offices	ELCO	Local census offices (LCOs) that open a year earlier than other LCOs to conduct operations required for a traditional (nonsampling) census.
economic census		The collective name for the censuses of construction, manufactures, minerals, minority- and women-owned businesses, retail trade, service industries, transportation, and wholesale trade, conducted by the Census Bureau every 5 years (in years ending in 2 and 7).
Economics and Statistics Administration	ESA	Much of the statistical, economic, and demographic information collected by the federal government is made available to the public through the ESA. The ESA has two principal agencies: the Census Bureau and the Bureau of Economic Analysis.
embedded housing unit	EHU	One of two kinds of housing units found at a special place. An EHU is a housing unit within a group quarters where the occupants live separately from others living in the group quarters. An example of an EHU is a house parent's room in a dormitory. Embedded means located within the building and not free-standing.

Term	Abbreviation	Description
emergency shelters		Includes shelters that operate on a first-come, first-served basis where people must leave in the morning and have no guaranteed beds for the next night or where people know they have a bed for a specified period of time even if they leave the building every day. Shelters also include facilities that provide temporary shelter during extremely cold weather (such as churches) and facilities that provide emergency shelter for runaway or neglected children or abused women. Emergency shelters are service locations. See hotels, motels, or other facilities; regularly scheduled mobile food vans; service locations; shelters for children who are runaways, neglected, or without housing; soup kitchens; transitional shelters.
enhanced list	E/L	Listing of addresses in blocks that were selected to be included in the Integrated Coverage Measurement survey. Conducted independently of the general address listing activities and enhanced using additional procedures to obtain the most complete address listing possible.
Enterprise Information System or Executive Information System	EIS	Used with the Cost and Progress System for Census 2000 to access reports and data from the warehouse and to report to the Department of Commerce on decennial issues, the schedule, and the cost framework.
enumeration		The process of interviewing persons and recording the information on census forms.
enumeration district		Obsolete term. Now called an assignment area.
enumerator		A Census Bureau employee who interviews people to obtain information for a census questionnaire. The term also applies to field personnel who perform activities associated with update/leave and urban update/leave.
Estimation Review System	ERS	A system used for a sampling census that provides the statistical results of the various types and phases of the estimation process to the analysts.
Executive Information System		See Enterprise Information System.
executive steering committee		The assistant to the associate director for the decennial census, associate director for the decennial census, principal associate director for programs, principal associate director/chief financial officer, associate director of field operations, and the deputy director.
extended city		See extended place.
extended place		A place that contains both urban and rural territory; i.e., an incorporated place or census designated place that is partially within and partially outside of an urbanized area or urban cluster. First used for Census 2000. Previously referred to as an "extended city," which applied only to incorporated places, subject to very specific criteria.
facility questionnaire		See Special Place Facility Questionnaire.

Term	Abbreviation	Description
false entity		A legal geographic entity of one type that is used to complete the coverage of another part of the Census Bureau's geographic hierarchy. The Census Bureau uses false entities to ensure complete coverage for certain levels of the hierarchy; for example, to ensure that all area in the nation is assigned to a geographic entity at the county level. The Census Bureau treats the District of Columbia as equivalent to both a state and a county for data presentation purposes; the county record is a false entity. The Census Bureau treats Alexandria, VA, as a place and as a statistical equivalent of both a county (see independent city) and county subdivision (see independent place); the county and county subdivision records are false entities.
feature		Any part of the landscape, whether natural (such as a stream or ridge) or artificial (such as a road or power line). In a geographic context, features are any part of the landscape portrayed on a map, including nonvisible boundaries of legal entities, such as city limits or county lines. See nonstreet features, nonvisible feature, visible feature.
federal information processing standards code	FIPS	A standardized set of numeric or alphabetic codes issued by the National Institute of Standards and Technology to ensure uniform identification of geographic entities through all federal government agencies. The entities covered are states, counties, metropolitan areas, congressional districts, foreign geographic entities, named populated and related location entities (such as places and county subdivisions), and American Indian and American Native areas.
field assignment	FA	A combination of the assignment areas used in a previous operation to form a better workload for an enumerator. See assignment area.
Field Division	FLD	Census Bureau. Plans and directs the collection of national sample survey, census, and other data at the local level. Data are collected through a flexible field organization of regional offices in 12 major cities across the country. The offices employ part-time interviewers who gather data by direct contact with the public. During major censuses, the division administers temporary regional census centers, district offices, and other offices.
field follow-up	FFU	A data collection procedure involving personal visits by enumerators to residential addresses to perform any of the following operations: resolve inconsistent or missing data items on returned questionnaires identified during content edit and possible enumeration errors discovered in coverage edit; conduct vacant/delete check; obtain data for blank or missing questionnaires; and check on addresses for which no questionnaire has been checked in.
field operations supervisor	FOS	Supervises activities of crew leaders and enumerators.
film optical sensing device for input to computers	FOSDIC	A device that reads microfilmed questionnaires and transfers the data to magnetic tape for the Census Bureau's mainframe computers. Created by the Census Bureau for the 1960 census.
follow-up	FU	A secondary census or survey operation, predominantly in data collection, carried out to successfully complete an initial operation. It is most often a telephone or personal visit interview to obtain missing data or clarify original responses. See field follow-up, nonresponse follow-up.
free-standing housing unit	FSHU	One of two kinds of housing units found at a special place. A FSHU is a living quarters that is physically separate from the group quarters at a special place. An example of an FSHU is a president's house at a college.

Term	Abbreviation	Description
Freedom of Information Act	FOIA	Created in 1974. An act that requires federal agencies to provide access to and copies of existing agency records to the public. Access can be denied only if records are within specific exempted categories, such as Title 13 data.
frontloading		Hiring and training approximately twice as many enumerators as are needed for decennial field operations to compensate for expected turnover.
functional status		The classification of a geographic entity as a legal or statistical entity. It further identifies a legal entity as an active, inactive, false, functioning, or nonfunctioning entity and, if active, denotes its fiscal independence and whether it provides general or limited special services. Functional status may determine an entity's eligibility to participate in various Census Bureau programs.
functioning entity		A generic term that refers to both active and inactive governmental units. (Even though inactive, a governmental unit has the legal capacity to carry out governmental functions; local people simply choose not to do so.) See active entity, governmental unit, inactive entity, nonfunctioning entity.
gated community		A community, composed of individual houses, duplexes, or apartment buildings, surrounded by a secured fence or other barrier allowing limited access through a secure gate.
General Services Agency	GSA	A central management agency that sets federal policy in such areas as federal procurement, real property management, and information resources management.
geocode		A code that identifies a specific geographic entity. For example, geocodes needed to identify a census block for data collection are the state code, the county code, and the block number.
geocoding		The assignment of an address, structure, key geographic location, or business name to a location that is identified by one or more geographic codes.
Geographic Base File/Dual Independent Map Encoding	GBF/DIME	The predecessor of TIGER®.
Geographic Catalog of Legal and Statistical Entities	GEO-CAT	A file that controls and describes the inventory of the higher-level geographic entities maintained by the Census Bureau, including their names, codes, attributes and hierarchical relationships. The GEO-CAT, which is part of the TIGER® system, does not include lower-level entities such as census tracts, block groups, and census blocks.
geographic code		A code, consisting of one or more alphanumeric or special-text characters, used to identify a specific geographic entity. Every geographic entity recognized by the Census Bureau is assigned one or more geographic codes. Also referred to as a geocode. See census code, federal information processing standards code.
geographic database		A computer-readable database whose primary structure includes geographic codes and/or coordinates (latitude and longitude), together with associated attributes. The TIGER® database is a geographic database.
geographic entity		A geographic unit of any type, legal or statistical, such as a state, county, place, county subdivision, census tract, or census block.

Term	Abbreviation	Description
geographic hierarchy		A geographic presentation that shows the geographic entities in a superior/subordinate structure. In this system of relationships among geographic entities, each entity (except the smallest one) is divided into lower-order units that in turn may be subdivided further. For example, states are subdivided into counties, which are subdivided into both county subdivisions and census tracts. The Census Bureau uses three sets of hierarchies: one is based on states and counties; another on American Indian areas, Alaska Native areas, and Hawaiian Home Lands; and a third on metropolitan or urban areas. See census geography, tabulation geography.
geographic information system	GIS	A computer system for the input, storage, processing, applications development, retrieval, and maintenance of information about the points, lines, and areas that represent the streets and roads, rivers, railroads, geographic entities, and other features on the surface of the Earth—information that previously was available only on paper maps.
geographic program participant database	GPP	A Census Bureau control file that records information about participation by local governments in census programs designed to improve the content of TIGER® and expand the master address list.
geographic reference file	GRF	A generic term for a file that contains geographic information such as area names, geographic codes, and selected x, y coordinate values. These files are necessary for the Census Bureau to organize the address list for the field activities and for production of tabulation displays.
Geographic Support System	GSS	The TIGER® system plus all other activities supporting the census and survey activities of the Census Bureau. This includes all decennial census geographic products, all economic and agriculture censuses geographic products, all American Community Survey geographic products, and the related computer systems. The Census Bureau's GSS also includes the geographic activities related to the master address file, the special census program, the current sample survey program, the Census Bureau's research and development activities, the operations that use the information collected by the Boundary and Annexation Surveys, references for map sources, etc.
Geographic Update System	GUS	The operations in the regional offices (ROs) and regional census centers (RCCs) that implemented the update of the information in the TIGER® database. Also, a computer software package for the 1990 census that enabled census staff in the Census Bureau's ROs/RCCs and the then Data Preparation Division to view, analyze, and interactively update and revise the information in the TIGER® database as a result of various field operations. See Geographic Update System for X Window (GusX).
Geographic Update System for X Window	GusX	The Census 2000 version of the Geographic Update System (GUS) software. It was more flexible, object-oriented, and user-friendly than the GUS, with operators at various decentralized sites using the Census Bureau's UNIX workstations to access and manipulate information in the TIGER® database. The X refers to the software that runs the X Window Utility program, together with a Motif graphical user interface, on a UNIX platform.
Geography Division	GEO	Census Bureau. GEO defines decennial census geography; creates and maintains the master address file; spatially locates addresses using the TIGER® database; maintains and updates TIGER®; and provides geographic support for other business, economic, and government surveys and censuses.

Term	Abbreviation	Description
Government Accountability Office	GAO	An investigative arm of the Congress that performs audits and evaluations of government programs and activities.
Government Printing Office	GPO	U.S. government. The mission of the Government Printing Office is to inform the nation by producing, procuring, and disseminating printed and electronic publications of the Congress as well as the executive departments and establishments of the federal government.
governmental unit	GU	A governmental unit is an organized entity which, in addition to having governmental character, has sufficient discretion in the management of its own affairs to distinguish it as separate from the administrative structure of any other governmental unit. To have governmental character, an entity must have existence as an organized entity and responsibility to the public.
group quarters	GQ	A place where people live or stay other than the usual house, apartment, or mobile home. Two general types of group quarters are recognized: institutional (for example, nursing homes, mental hospitals or wards, hospitals or wards for chronically ill patients, hospices, and prison wards) and noninstitutional (for example, college or university dormitories, military barracks, group homes, shelters, missions, and flophouses). Group quarters may have housing units on the premises for staff or guests.
group quarters enumeration		An operation designed to enumerate people living or staying in group quarters. Enumerators visit each special place with group quarters, list the names of the people living or staying there, and leave an Individual Census Report for each person to complete. Enumerators return at a later date to pick up the forms and, if necessary, conduct interviews to obtain any missing information or conduct interviews with nonrespondents. See group quarters.
hard to enumerate	HTE	A term used to describe an area whose environment or population may present difficulties for enumeration.
Hawaiian Home Lands	HH	Areas created as a result of the Hawaiian Homes Commission Act of 1920 to provide agricultural, pastoral, and residential land for native Hawaiians.
headquarters	HQ	A term sometimes used to designate the Census Bureau facility, staff, and operations in Suitland, MD.
heterogeneity		Heterogeneity occurs when blocks of housing units assigned to sampling strata or groupings do not have equal chances of being included or missed by the census or survey. Heterogeneity creates difficulty for the small area estimation process because the correction factor is applied to all people with the specified characteristic in that sampling poststratum even though some of them do not actually have the coverage characteristics.
highest elected official		The elected or appointed person who is the chief executive official of a governmental unit and is most responsible for the governmental activities of the governmental unit, such as the governor of a state, chair of a county commission, or mayor of an incorporated place.
historic areas of Oklahoma		The area encompassing the former American Indian reservations that had legally established boundaries during the period 1900 through 1907 but were dissolved during the 2- to 3-year period preceding the establishment of Oklahoma as a state in 1907. The 1980 census tabulated data for this entity, but it was replaced for the 1990 census by tribal jurisdiction statistical areas.

Term	Abbreviation	Description
homogeneity		Homogeneity assumes that all people in a particular sampling stratum or poststratum have an equal chance of being included or missed by the census or survey. A lack of homogeneity in a particular sample block is not an error, but it does create difficulty for the small area estimation process. This happens because the correction factor is applied to all people with the specified characteristic in that poststratum even though some of them do not exhibit the same coverage characteristic.
hotels, motels, or other facilities		Hotels, motels, or other facilities for which vouchers are provided or that operate under contract to provide shelter to people without housing. These are service locations. See emergency shelters; regularly scheduled mobile food vans; service locations; shelters for children who are runaways, neglected, or without housing; soup kitchens; and transitional shelters.
house-number and street-name address	HN/SN	An address assigned to a specific structure, consisting of a number and the street name on which the structure is located. The address may or may not be used for mail delivery. See address, basic street address, city-style address, mailing address.
household		A person or group of persons who live in a housing unit. These equal the count of occupied housing units in a traditional census.
householder		The member of a household who lives at the housing unit and owns or rents the living quarters. If there is no such person present, any household member who is at least 15 years of age can answer the questionnaire.
Housing and Household Economic Statistics Division	HHES	Census Bureau. In concert with others at the Census Bureau, HHES compiles, analyzes, and publishes data on the physical, social, and financial characteristics of the nation's housing and on the socioeconomic characteristics of the nation's population.
housing unit	HU	A house, an apartment, a mobile home or trailer, a group of rooms, or a single room that is occupied as a separate living quarters, or, if vacant, is intended for occupancy as a separate living quarters. See separate living quarters.
identification number		See census identification number.
imputation		When information is missing or inconsistent, the Census Bureau uses imputation to assign values. Imputation relies on the tendency of households of the same size within a small geographic area to be similar in most characteristics. For example, the value of "rented" is likely to be imputed for a housing unit not reporting on owner/renter status in a neighborhood with multiunits or apartments where other respondents reported "rented" on the census questionnaire. There are two major types of imputation: (1) allocation, in which missing values for individual items are filled in on the basis of other reported information for the person or household (or from other persons or households with similar characteristics) and (2) substitution, in which <i>all</i> of the information for a person or household is created from other persons or households with similar characteristics.
incorporated place		A type of governmental unit incorporated under state law as a city, town (except the New England states, New York, and Wisconsin), borough (except in Alaska and New York), or village and having legally prescribed limits, powers, and functions. See consolidated city, governmental unit, independent city, legal entity, place.

Term	Abbreviation	Description
independent city		An incorporated place that is a primary division of a state and legally not part of any county. The Census Bureau treats an independent city as both a county equivalent and county subdivision for data tabulation purposes. See city, county equivalent, county subdivision, incorporated place.
independent place		In a state in which the Census Bureau recognizes minor civil divisions (MCDs), an incorporated place that is not legally part of any MCD. The Census Bureau treats an independent place as equivalent to a county subdivision and as an incorporated place for data presentation purposes. Independent places exist in 23 states and the District of Columbia.
index map		A map that shows the relationship between the map sheets, including inset maps, that cover a specific mapped geographic entity.
Individual Census Questionnaire	ICQ	A questionnaire that contains population questions for one person. The form is used at both soup kitchens and regularly scheduled mobile food vans. This form asks if the person has a usual residence but does not ask housing questions. It also asks about the person's use of services at shelters, soup kitchens, or mobile food vans. Enumerators conduct personal interviews using this form. See service-based enumeration, targeted nonsheltered outdoor location.
Individual Census Report	ICR	A questionnaire that is used during group quarters enumeration and at two service locations (shelters and targeted nonsheltered outdoor locations) that contains population questions for one person. There are both long- and short-form versions. In most group quarters, additional questions are asked of a sample (1 in 6) of the population. The forms ask if the person has a usual residence but does not ask housing questions. Enumerators distribute this form to the clients to complete. At targeted nonsheltered outdoor locations enumerators conduct personal interviews using this form. See group quarters enumeration, self-enumerating places.
industry and occupation	I&O	The current or most recent job activity reported on the census long-form questionnaire. These responses require coding and classification processing.
inset map		A Census Bureau map that displays an area at a larger scale than the scale of its parent sheet. Inset maps generally cover a densely developed area that cannot be shown clearly at the map scale of the parent sheet. See map inset.
Inspector General	IG	Department of Commerce. The IG conducts and supervises audits, inspections, and investigations of Department of Commerce programs and operations.

Term	Abbreviation	Description
Integrated Coverage Measurement	ICM	<p>This operation was proposed for Census 2000 but was not implemented. The objective of such an operation is to measure how well the Census Bureau counted people and housing in a census. A large-scale sample survey is conducted independently of regular census operations. The sample consists of block clusters in urban and rural areas. The results are matched to census results and estimates of the undercount are created. It is a micro-level approach; that is, case-by-case matching.</p> <p>There are three phases to such an operation. In the <i>housing unit phase</i>, an inventory of housing within sample blocks is conducted separately from the census. In the <i>computer-assisted personal interview (CAPI) phase</i>, an independent sample of nonrespondents is taken, and telephone and personal visit second interviews are conducted to create an independent roster. In the <i>person-matching phase</i>, persons enumerated in the census are matched to persons enumerated in the CAPI phase, follow-up interviews for discrepancies are conducted, unresolved cases are imputed as a last resort, and statistical procedures are used to produce estimates of the people missed or duplicated in the census. The final phase of such an operation is to use dual system estimation to compare the census counts to the ICM counts and create estimation factors to adjust the census results. Also called the Quality Check Survey.</p>
interactive voice recognition	IVR	An automated telephone system that offers callers different menu choices covering a variety of predetermined topics.
internal point		A set of geographic coordinates (latitude and longitude) that is located within a specified geographic entity. For many entities, this point represents the approximate center of the entity; for some, the shape of the entity or the presence of a body of water causes the central location to fall outside the entity or in water, in which case the point is relocated to land area within the entity. The geographic coordinates are shown in degrees to six decimal places in census products.
Internet Questionnaire Assistance	IQA	An operation which allows respondents to use the Census Bureau's Internet site to (1) ask questions and receive answers about the census form, job opportunities, or general questions about the purpose of the census and (2) provide responses to the short form.
Island Areas	IA	Islands included in the U.S. Census of Population and Housing are U.S. Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, and American Samoa. Puerto Rico is sometimes called an island area. These were formerly called outlying areas.
invalid return detection	IRD	A procedure for identifying invalid non-ID'd forms, that is, forms returned in Census 2000 as an attempt to introduce error into the population count.
joint use area		Territory that is administered, claimed, and/or used by two or more American Indian tribes. It may consist of overlap of territory of adjoining American Indian reservations or Oklahoma tribal statistical areas, or off-reservation trust land for one tribe that is located within the reservation of another tribe. Such territory was referred to as joint area for the 1990 census.
key from image	KFI	An operation in which keyers enter data by referring to a scanned image of a questionnaire for which data could not be recognized by optical character recognition with sufficient confidence.

Term	Abbreviation	Description
key from paper	KFP	An operation in which keyers enter data directly from a hardcopy questionnaire which could not be read by optical character recognition.
large household	LHH	A housing unit with more than six persons.
large household follow-up	LHFU	A census operation that follows up on a household that indicated on the census form more than six persons in that housing unit. The questionnaire only allows for the reporting of information for six persons per household. This operation is included in the coverage edit.
late mail return	LMR	Mail received after the cut-off date for identifying nonresponding housing units for the nonresponse follow-up operation.
legal entity		An entity whose origin, boundary, name, and description result from charters, laws, treaties, or other administrative or governmental action, such as the United States, states, the Island Areas, counties, cities, townships, boroughs, towns, villages, American Indian reservations, Alaska Native Villages, congressional districts, and school districts. The legal entities recognized for a decennial census are those in existence on January 1 of the decennial census year.
list/enumerate	L/E	A method of data collection in sparsely populated (rural) and remote areas, such as remote Alaska. The procedures are to list addresses or physical locations for housing units, enumerate the household, and update the census map as needed. The enumerators list each residential address or location description and conduct the enumeration in one visit using a short- or long-form according to the sampling pattern for the assignment area.
lister		A census employee who obtains addresses and related information and records the information on address listing pages and census maps.
living quarters	LQ	A dwelling where people live, stay, or could live. Living quarters are classified as housing units or group quarters. They are usually found in structures intended for residential use but also may be found in structures intended for nonresidential use as well as tents, vans, shelters for people without housing, dormitories, barracks, and so forth.
local census office	LCO	Temporary Census Bureau offices established for Census 2000 data collection purposes. Called "district office" in previous censuses.
Local Update of Census Addresses	LUCA	A Census 2000 program, established in response to requirements of Public Law 103-430, that provided an opportunity for local and tribal governments to review and update individual address information in the master address file and associated geographic information in the TIGER® database to improve the completeness and accuracy of both computer files. The governments had to sign a confidentiality agreement to participate. Also called the address list review program.
Local Update of Census Addresses field verification		An operation verifying the existence and the residential status of addresses given to the Census Bureau by local officials during the LUCA program.
location description		A description of the physical location or characteristics of a living quarters that does not have a house-number and street-name address.

Term	Abbrevia- tion	Description
locator map		A census map that helps enumerators find the location of and determine how to travel to their assignment areas. The map covers more area than the assignment area.
long form	LF	The decennial census questionnaire containing 100 percent and sample questions. See short form.
long-form sampling		A variable rate sampling plan is used to determine which households receive the long form. The Census Bureau samples for the long form using four rates based on the size of a government. Nationally, or overall, 1 in 6 households receive a long form. This is a sample for content; that is, a sample determining which households receive the long-form content.
mail census area		The area covered by the mailout/mailback, update/leave, and urban update/leave methods of enumeration.
mail response rate		The total number of <i>checked-in</i> questionnaires returned by mail divided by the number of questionnaires mailed by the U.S. Postal Service or delivered by census enumerators. This check-in rate differs from a true mail response rate because it reflects forms that have been processed and not necessarily all of those that have been received.
mail return rate		The total number of households returning a questionnaire by mail divided by the number of <i>occupied</i> housing units that received a questionnaire by mail or by a census enumerator (the only ones that can return a questionnaire). This measure cannot be derived until the enumeration is completed and the final number of occupied housing units is determined.
mailing address		This address is used by a living quarters, special place, business establishment, and the like to receive mail. It may be a house number and street name, which may be followed by an apartment, unit, or trailer lot designation; building or apartment complex name and apartment designation; trailer park name and lot number; post office box or drawer; rural route or highway contract route, which may include a box number; or general delivery. A mailing address also includes a ZIP Code. A mailing address may serve more than one living quarters, establishment, or the like. See basic street address, city delivery area, city-style address, house-number and street-name address, non-city-style address, nondelivery area, rural delivery area, ZIP Code.
mailout/mailback	MO/MB	A method of data collection in which the U.S. Postal Service delivers addressed questionnaires to residents who are asked to complete and mail back the questionnaire to the appropriate Census Bureau office. This method is used for more than 80 percent of all households (usually city-style addresses).
Management Information System	MIS	Provides decision support functions, such as critical-path analysis and what-if analysis. Provided information on dates, the responsible organization, budget, cost to date, and current progress of Census 2000 operations. It includes the master activity schedule, the Executive Information System, and the Cost and Progress System.
map feature		Any part of the landscape, whether visible—either physical (i.e., natural features such as water bodies and their shorelines, mountain peaks) or cultural (i.e., manmade features such as roads, streets, railroads, power lines)—or invisible on the ground (e.g., boundaries of legal entities, national parks, and military installations; property lines; imaginary street extensions), that is portrayed on a map as a point, line, or area. See boundary, feature, nonstreet feature.

Term	Abbreviation	Description
map image metafile	MIM	A computer file that provides a full-image description of a census map in digital form (a human-readable format). The regional offices, regional census centers, and National Processing Center use MIMs to create maps for printing or placing on CD-ROM. See single MIM-based integrated mapping system.
map inset		A sketch map drawn by an enumerator, lister, etc., to represent an enlargement of an area that, on the original Census Bureau map, is too small to clearly display added streets and/or map spots and map-spot numbers. The map usually is drawn on the back of the map sheet that contains the enlarged area, but a separate sheet of paper may be used for this purpose. See inset map.
map legend		An illustrated list of map content: the symbols, type styles, and, if appropriate, shading or colors shown on a map or map series, and the meaning of each.
Map Plotting System	MAPS	The MAPS site or area is the portion of the regional office/regional census center in which maps are produced, assembled, and stored.
map spot		An enumerator places a dot on a census map to show the location of one or more living quarters. The enumerator assigns a number, unique within the census block, to each map spot to correspond to the entry in the address register for a basic street address or residential structure. The map spots are entered into the TIGER® system. For Census 2000, map spots were identified primarily by census listers and enumerators during address listing and list/enumerate operations but also created during the Local Update of Census Addresses, update/leave, rural update/enumerate, and some follow-up operations.
map spot number		The number assigned uniquely to each map spot within a census collection block. The same number could represent more than one living quarters if they were located in a multiunit structure. Map-spot numbers began with "1" in each collection block and continued until every residential structure in a block was represented by a map spot. Map-spot numbers could include one or more alphabetic suffixes, to account for residential structures added between previously listed ones during quality assurance rework of a listed block, update/leave, update/enumerate, and Census 2000 follow-up operations; e.g., if a missing living quarters was found between map spots 11 and 12, it could be assigned the number 11A. There could be gaps in the numbering system if a map spot had been deleted because a listed living quarters was found not to exist or to have been mislocated. If a map spot represented more than one living quarters, the number of living quarters was shown in parentheses after the map spot number on the map. The Census Bureau assigned special 4-digit numbers to represent various types of special places/group quarters.
Marketing Services Office	MSO	Census Bureau. The MSO creates innovative and effective marketing communication channels, enhances the corporate marketing infrastructure, infuses a marketing culture and customer orientation, institutionalizes internal customer information systems, and assists in new product development.
master activity schedule	MAS	A schedule of all activities involved in the planning, preparation, conduct, and data capture, processing, and dissemination of the Census 2000.

Term	Abbreviation	Description
master address file	MAF	The MAF is a list of every living quarters nationwide and their geographic locations. The computer file was created by combining the addresses in the 1990 address control file with the current versions of the U.S. Postal Service delivery sequence file, and supplementing this with address information provided by state, local, and tribal governments. The MAF ties to the TIGER® database. The MAF was updated throughout the decade to provide addresses for delivery of Census 2000 questionnaires, to serve as the sampling frame for the Census Bureau's periodic demographic surveys, and to support other Census Bureau statistical programs. See decennial master address file.
Master Address File Geocoding Office Resolution	MAFGOR	An operation where the regional offices and regional census centers try to find the location of addresses from the U.S. Postal Service that did not match to the records in TIGER®. Staff use atlases, maps, city directories, and the like to locate these addresses and add them to TIGER®.
master address file update file	MAFUF	Census Bureau staff do not individually key new addresses and address revisions directly into the master address file (MAF). Instead, using a specified format, they key the relevant information into a file—MAFUF—that stores the information until the Geography Division is ready to merge the complete updated file into the MAF in a batch process.
metropolitan area	MA	A collective term established by the federal Office of Management and Budget (OMB) in 1990 to refer to metropolitan statistical areas, consolidated metropolitan areas, New England county metropolitan areas, and primary metropolitan statistical areas. The OMB establishes MAs based on census data.
metropolitan statistical area	MSA	These are designated by the federal Office of Management and Budget for use by federal statistical agencies. These geographically based entities are a core area with a large population nucleus plus adjacent communities with a high degree of economic and social integration with the core. An MSA consists of one or more counties, except in New England, where MSAs are defined in terms of cities and towns; however, New England county metropolitan areas are defined in terms of counties. See consolidated metropolitan statistical area, metropolitan area, New England county metropolitan area, primary metropolitan statistical area, and statistical entity.
Military Census Report	MCR	Questionnaire used to conduct the census in military installations.
military/maritime enumeration		An operation counting domestic military installations and ships assigned to a home port in the United States and maritime vessels in operation on Census Day.
minor civil division	MCD	For demographic census purposes, a primary government, such as a township, or an administrative subdivision of a county, such as a precinct or magisterial district.
multiunit structure		A building that contains more than one housing unit (for example, an apartment building).
municipality		A legally established entity in Alaska and the Northern Mariana Islands. The Census Bureau treats a municipality as equivalent to a county for data presentation purposes. The Bureau also treats the municipality (Anchorage) in Alaska as an incorporated place. This designation in Alaska is new for Census 2000. See borough, census area, city and borough, county.

Term	Abbreviation	Description
municipio		A type of governmental unit that is the primary legal subdivision of Puerto Rico. The Census Bureau treats municipios as the statistical equivalents of counties. See county equivalent and governmental unit.
must-hold boundary		A map feature that the Census Bureau agrees to recognize as the boundary of a tabulation census block. The purpose is to ensure that data are available for a specific geographic area because its component areas have been identified as unique census blocks.
National Academy of Sciences	NAS	U.S. government. The NAS is a private, nonprofit society of scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare.
National Archives and Records Administration	NARA	U.S. government. The NARA oversees the management of federal government records, including individual census records after 72 years, presidential diaries, historic correspondence, and a display of presidential gifts from around the world.
National Content Survey (1996)		One of the test censuses done as part of the planning and testing process for Census 2000. It was the principal vehicle for testing and evaluating subject content for Census 2000. It also provided information on questionnaire design and on mailing strategy and techniques to improve coverage.
National Institute of Standards and Technology	NIST	Department of Commerce. An organization under the Technology Administration. The NIST promotes United States economic growth by working with industry to develop and apply technology, measurements, and standards.
National Operations Center	NOC	The staff and facilities at the National Processing Center that served as one of the data capture centers for Census 2000.
National Processing Center	NPC	The permanent Census Bureau processing center in Jeffersonville, Indiana. It included the National Operations Center.
National Research Council	NRC	The council is the principal agency of the National Academy of Sciences for advising the government, the public, and the scientific and engineering communities.
National Technical Information Service	NTIS	Department of Commerce. An organization under the Technology Administration. The NTIS promotes the nation's economic growth and job creation by providing access to federally produced information for the public and production services to federal agencies.
National Telecommunications and Information Administration	NTIA	Department of Commerce. The NTIA is the executive branch's principal voice on domestic and international telecommunications and information technology issues.
New Construction Capture	NCC	This operation was conducted shortly before Census 2000. Local and tribal governments reported new living quarters built since the Local Update of Census Addresses (LUCA) operation.
New England county metropolitan area	NECMA	A county-based area designated by the federal Office of Management and Budget to identify metropolitan areas in New England.
no identification number	Non-ID	A response without a census identification number. The census identification number associates the response with a specific address in the master address file.

Term	Abbreviation	Description
non-city-style address		An address that does not use a house number and street name. This includes rural routes and highway contract routes, which may include a box number; post office boxes and drawers; and general delivery. See address, city-style address, mailing address, nondelivery area, and rural delivery area.
nondelivery area		An area in which the U.S. Postal Service does not deliver mail to homes, businesses, and the like. Instead, the residents must pick up their mail at a local post office, using either a post office box or drawer or general delivery. See city delivery area, noncity-style address, and rural delivery area.
nonfunctioning entity		A legal entity that cannot have elected or appointed officials to provide services or raise revenues. Such entities include administrative areas, such as voting districts, and areas from which people are elected to a legislative body, such as congressional districts and state legislative districts. Some counties and minor civil divisions are nonfunctioning entities. See legal entity.
nongovernmental organization	NGO	The partnerships developed during Census 2000 planning included national and local organizations and community groups. See partnerships.
nonresponse	NR	Housing units from which no questionnaire was returned by mail or from which a telephone response was not received.
nonresponse conversion operation	NRCO	A step in the Accuracy and Coverage Evaluation survey process during the person interviewing stage. At a cutoff date, all person interviewing cases are brought in from the field. The best interviewers are assigned to the unresolved cases. This is a last attempt to convert refusals to responses.
nonresponse follow-up	NRFU	The objective is to obtain a completed questionnaire from households for which a questionnaire was not received by mail or from which a telephone response was not received. A census follow-up operation in which temporary field staff, known as enumerators, visit the housing units in which these households reside.
nonsampling error		Errors that occur during the measuring or data collection process. Nonsampling errors can yield biased results when most of the errors distort the results in the same direction. Unfortunately, the full extent of nonsampling error is unknown. Decennial censuses traditionally have experienced nonsampling errors, most notably undercount, resulting from people being missed in the enumeration processes.
nonstreet feature		A natural or artificial part of the landscape, such as a stream, ridge, road, or power line. See feature, nonvisible feature, and visible feature.
nonvisible feature		A boundary of a legal entity, such as a county line, city limit, property line, and so forth. See feature, nonstreet feature, and visible feature.
occupied housing unit		A housing unit is classified as occupied if it is the usual place of residence of the person or group of persons living in it at the time of enumeration or if the occupants are only temporarily absent; for example, away on vacation. Occupied rooms or suites of rooms in hotels, motels, and similar places are classified as housing units only when occupied by permanent residents, that is, individuals for whom the facility is their usual place of residence.

Term	Abbrevia- tion	Description
Office of Management and Budget	OMB	U.S. government. The OMB's predominant mission is to assist the President in overseeing the preparation of the federal budget and to supervise its administration in Executive Branch agencies.
Office of Personnel Management	OPM	U.S. government. The OPM is the federal government's human resources agency.
operational test dry run	OTDR	A practice test of the data capture centers.
Operations Control System 2000	OCS/2000	This system was one of the decennial field interface systems and was used for control, tracking, and progress reporting for all field operations conducted for Census 2000, including production of materials used by field staff to do their work.
optical character recognition	OCR	Technology that uses an optical scanner and computer software to "read" human handwriting.
optical mark recognition	OMR	Technology that uses an optical scanner and computer software to scan a page, recognize the presence of marks in predesignated areas, and assign a value to the mark depending on its specific location and intensity on a page.
outlying areas		Obsolete term. See Island Areas.
overseas enumeration		Counts federal employees assigned overseas (including members of the Armed Forces) and their dependents, and persons on board United States military ships assigned to a foreign home port.
P-sample		People identified as nonmovers or out-movers and were residents of the A.C.E. survey housing unit on Census Day.
paper-assisted personal interview	PAPI	A method of data collection in which the enumerator uses a paper form to complete the interview.
parish		A type of governmental unit that is the primary legal subdivision of Louisiana, similar to a county in other states. See county equivalent and governmental unit.
Participant Statistical Areas Program	PSAP	A Census 2000 program that provided tribal and local officials with the opportunity to review and revise existing statistical areas and identify new ones. The program included census tracts, block groups, census designated places, and census county divisions. See statistical entity.
partition		A portion of the TIGER® database separated to effectively manage the size of that database in order to support operations such as updating, processing, and mapping of a specific part of the database. A partition usually consists of an entire county or statistically equivalent entity, but a county that has many records in the database may be divided into multiple partitions to allow the computer to process, and enable staff to work with, smaller files. For most operations, only one person at a time can access a partition. Also referred to as a county partition.
partnerships		Agreements with state, local, and tribal governments and community groups that gave these groups an opportunity to participate in various ways in Census 2000.
personal visit	PV	Face-to-face contact between a member of the public and an enumerator to obtain data.

Term	Abbreviation	Description
physical/location description		A short written description of the location and physical characteristics of a living quarters that does not have a house-number/street-name address. The description, together with the Census Bureau map showing the location of the map spot number for the living quarters, is intended to help Bureau staff recognize this living quarters in the field. (Note: After Census 2000, the Census Bureau changed this to “physical description,” relying on the location of the numbered map spot on the Census Block Map to identify the approximate site of each residential structure.)
place		A concentration of population either legally bound as an incorporated place or identified by the Census Bureau as a census designated place. See census designated place, incorporated place, legal entity, and statistical entity.
place of birth	POB	State or foreign country in which a person was born.
place of work	POW	The street address or location of a person’s current workplace.
planning database		A geographic database containing prior census housing, demographic, and socioeconomic variables correlated with nonresponse and undercounting data and used to identify specific geographic areas (for example, tracts) that could benefit from special enumeration methods to improve coverage.
Planning, Research, and Evaluation Division	PRED	Census Bureau. Provides technical expertise and executive leadership for planning future censuses and surveys. Coordinates policy and program related activities for future censuses and surveys.
political entity		See governmental unit and legal entity.
Population Division	POP	Census Bureau. Provides regularly updated information on the population of the United States and its demographic, geographic, and social characteristics. The division’s International Programs Center provides demographic and socioeconomic data on all major countries.
postal validation check	PVC	The U.S. Postal Service workers validate the master address file for addresses within the mailout/mailback area. Formerly called casing.
post-enumeration survey	PES	Evaluates coverage on a case-by-case basis using the Dual System Estimation methodology. Provides undercount information for detailed categories, such as renter/home owner and racial and ethnic group, which is not possible with demographic analysis. The Census 2000 Accuracy and Coverage Evaluation was a post-enumeration survey.
postmaster return	PMR	See undeliverable as addressed.
poststratum		The grouping of people within a particular stratum: for example, all white, non-Hispanic male renters ages 18–22 (poststratum) in a rural area (stratum).
Pre-Appointment Management System/Automated Decennial Administrative Management System	PAMS/ADAMS	An integrated structure of administrative management programs that supports applicant tracking and processing, background checks, selection records, recruiting reports, personnel and payroll processing, and archiving of historical data. This system was used in the hiring of temporary workers for Census 2000.
precanvass		See block canvassing.
prelist		See address listing.

Term	Abbreviation	Description
primary metropolitan statistical area	PMSA	A geographic entity designated by the federal Office of Management and Budget for use by federal statistical agencies. If an area meets the requirements to qualify as a metropolitan statistical area and has a population of 1 million or more, two or more PMSAs may be designated within it if they meet published statistical criteria and local opinion favors the designation. When PMSAs are designated within an MSA, the larger area of which they are components is designated a consolidated metropolitan statistical area. See statistical entity.
primary selection algorithm	PSA	Computer program applied to the decennial response file (DRF) to eliminate duplicate responses and to determine the housing unit record and the persons to include at the housing unit. After this procedure, the DRF is merged with the decennial master address file to create the census unedited file.
Privacy Act	PA	A 1974 act that places restrictions on the collection, use, maintenance, and release of information about individuals. It gives individuals the right to see records about themselves, to obtain copies of their records, to have records corrected or amended with agency approval, and to have a statement of disagreement filed in their records if the agency does not approve the correction or amendment.
Privacy Act notice		Form D-31 is a notice that advises persons of the authority under which the Census Bureau collects information, how it will use the information, and the effect of not answering a question.
production rate		A performance measure calculated as the number of cases completed within a specified time period: for example, cases completed per hour or cases completed per day.
Program for Address List Supplementation	PALS	This program was discontinued in 1997. It was created for Census 2000 to provide governmental units and regional and metropolitan agencies an early opportunity to submit lists of individual addresses for their communities to the Census Bureau for use in building the master address file.
program master plans	PMP	These documented all preparatory, field, processing, and statistical requirements for each major Census 2000 operation. The plans were coordinated by the Decennial Management Division program management staff.
Program Steering Committee	PSC	The PSC and the Management Integration Team provided the structure for the early planning of Census 2000 and were replaced by the Census Operational Managers, the Issue Resolution/Change Control Board, and the Decennial Division Chiefs Steering Committee.
pseudo-LCO		For Census 2000, where the land area under the authority of an American Indian tribe or the populated area of a military base was situated in more than one state or included widespread discontinuous parcels of land that could not satisfactorily be included within the boundary of a single local census office (LCO), the Census Bureau assigned such lands to the LCO that contained the administrative offices or headquarters of the tribe or base. As a result, each tribe or base worked with only one LCO for the census. The Census Bureau informally referred to the lands involved in the reassigned areas as pseudo-LCOs because they were not actually LCOs in their own right. Each pseudo-LCO was assigned a unique code; the first two digits were those of the regional census center (RCC) in which the pseudo-LCO was physically located and the last two digits were 66 through 89. Thus, an RCC could contain as many as 24 pseudo-LCOs.

Term	Abbreviation	Description
pseudo-tract		See interim census tract.
pseudo-voting district	pseudo-VTD	An area for which the Census Bureau reports voting district (VTD) data, even though the boundary of the actual VTD was adjusted by the reviewing officials so that it no longer matches the legally established boundary. Because the Census Bureau required that VTDs conform to census blocks for data presentation purposes, participants had to adjust some VTDs to use census block boundaries. Any VTD that was not identified by a participant as an actual VTD was shown with a "P" VTD indicator flag in the Census 2000 Redistricting Data (Public Law 94-171) Summary File. See voting district.
Public Information Office	PIO	Census Bureau. Manages relations with the news media, produces radio and video news releases, distributes daily newspaper clips of Census Bureau stories, administers the foreign visitors program, and writes and edits a variety of publications.
Public Law 94-171	P.L. 94-171	The public law requiring the Census Bureau to provide selected decennial census data tabulations to the states by April 1 of the year following the census. These tabulations are used by the states to redefine the areas included in each congressional district and the areas in other districts used for state and local elections, a process called redistricting.
Public Law 103-430	P.L. 103-430	The public law that amends Title 13, U.S. Code, to allow designated local and tribal officials access to the address information in the master address file to verify its accuracy and completeness. This law also requires the U.S. Postal Service to provide its address information to the Census Bureau to improve the master address file.
public use form	PUF	A form issued by a federal agency to obtain information from the public. A PUF that is to be administered to ten or more persons requires prior approval and clearance by the Office of Management and Budget.
public use microdata area	PUMA	A geographic entity for which the Census Bureau provides specially selected extracts of raw information from a small sample of long-form census records that have been screened to protect confidentiality of the census records. The extract files are referred to as public use microdata samples. For Census 2000, PUMAs, which must have a minimum census population of 100,000 and cannot cross a state line, received a 5 percent sample of the long-form records; these records were presented in state files. These PUMAs were aggregated to form "super-PUMAs," which required a minimum census population of 400,000 and received a 1 percent sample in a national file. (For the 1990 census, the 1 percent PUMAs needed a minimum census population of only 100,000, could cross state lines, and could cover areas that were different from the 5 percent PUMAs.) An area received both the 5 percent and 1 percent files when a super-PUMA coincided with a single PUMA. PUMAs for Census 2000 were delineated by state officials and comparable officials in the District of Columbia and Puerto Rico. As in 1990, the Census Bureau provided a 10 percent sample file each for Guam and the Virgin Islands. Data users can use these files to create their own statistical tabulations and data summaries. PUMAs were referred to as county groups for the 1980 and earlier censuses.
public use microdata sample	PUMS	Computerized files containing a small sample of individual long-form census records showing the population and housing characteristics of the people included on those forms. See public use microdata area.

Term	Abbreviation	Description
Puerto Rico	PR	See Island Areas.
Puerto Rico area office	PRAO	This is equivalent to a mini regional census center and has nine local census offices reporting to it.
quality assurance	QA	A systematic approach to build excellence into a process.
quality check		See Integrated Coverage Measurement.
quality control	QC	Using various statistical methods to validate that products meet standards.
questionnaire		The census or survey form on which a respondent or enumerator records information requested by the Census Bureau for a specific census or special survey.
Questionnaire Assistance Center	QAC	Centers established by local census offices to assist respondents in completing their questionnaires. Established in community centers, large apartment buildings, and so forth and staffed by volunteers and Census Bureau employees. See Walk-In Questionnaire Assistance Center.
<i>Questionnaire Reference Book</i>	QRB	This book provides detailed instructions to enumerators on how to fill out the census form.
Race and Ethnic Advisory Committees	REAC	An in-house term referring to the separate advisory committees on the race and ethnic populations. The original committees were the Census Advisory Committee on the African American Population, Census Advisory Committee on the American Indian and Alaska Native Populations, Census Advisory Committee on the Asian and Pacific Islander Populations, and Census Advisory Committee on the Hispanic Population. In 2000, the Asian and Pacific Islander Populations Committee became two committees—the Asian Advisory Committee and the Native Hawaiian and Other Pacific Islander Advisory Committee.
Race and Ethnic Targeted Test	RAETT	A test, conducted in 1996 in selected areas of the country, to evaluate alternative formats and sequencing of the race, Hispanic-origin, and ancestry questions.
ready for use	RFU	Indicates that the installation of hardware and software has passed testing and is ready for use.
reapportionment		The redistribution of seats in the U.S. House of Representatives among the states on the basis of the most recent decennial census as required by Article 1, section 2 of the Constitution. See apportionment, redistricting.
redistricting		The process of revising the geographic boundaries of areas from which people elect representatives to the U.S. Congress, a state legislature, a county or city council, a school board, and the like to meet the legal requirement that such areas be as equal in population as possible following a census. See apportionment, reapportionment.
Redistricting Data Program	RDP	A decennial census program that permits state officials to identify selected map features they want as block boundaries and specific areas, such as voting districts for which they need census data. See Block Boundary Suggestion Project, redistricting, voting district.
refusal		Reluctance by residents, apartment managers, local officials, or others to cooperate with census employees.
region (census geographic)		A grouping of states established by the Census Bureau for the presentation of census data. Each region (Northeast, South, Midwest, and West) is subdivided into divisions. See division (census geographic), statistical entity.

Term	Abbreviation	Description
regional census center	RCC	One of 12 temporary Census Bureau offices established to manage local census office activities and to conduct geographic programs and support operations, such as automated map production. The Census Bureau also operates an area office to manage census operations in Puerto Rico.
regional director	RD	The head of a regional office.
Regional Elected Officials Meeting	REOM	One of a series of regional meetings conducted by the Census Bureau with elected officials of local and state governments to encourage their support for Census 2000.
regional office	RO	One of 12 permanent offices established for the management of all census operations in an area that covers several million housing units.
regularly scheduled mobile food vans		Includes mobile food vans that are regularly scheduled to visit designated street locations for the primary purpose of providing food to people without housing. These are service locations. See service-based enumeration.
reinterview		The objective is to verify that enumerators collected accurate information. A sample of households in an assignment area is contacted again in person or by telephone. An enumerator re-asks certain questions and compares the answers to the original questionnaire. This verifies that the enumerator visited the correct address and that the questionnaire was completed accurately. This operation is performed in all areas after nonresponse follow-up and list/enumerate or rural update/enumerate.
reminder/thank you card		This is a postcard sent to addresses on the decennial master address file to remind respondents to return their census questionnaires or to thank them if they already have. All addresses in mailout/mailback areas receive a postcard. The Census Bureau conducts a blanket-mailing of these postcards to postal patrons (no addresses) in update/leave areas.
remote Alaska enumeration		List/enumerate is used for remote parts of Alaska. The unique aspect of remote Alaska enumeration is it begins in mid-February so enumerators can reach people living in remote locations before the spring thaw. After the spring thaw, travel to these areas is difficult. Questions are asked as of Census Day.
replacement questionnaire		A second questionnaire sent to addresses on the decennial master address file in mailout/mailback areas to increase mail response rates as part of the questionnaire mailing strategy. This was not used for Census 2000.
request for proposal	RFP	A government announcement in the <i>Commerce Business Daily</i> and on the Internet requesting vendors to propose a technical solution with costs for a statement of need or a statement of work. See statement of need, statement of work.
requirements initiative	RI	The documentation of business plans in support of expenditure of funds for acquisition of information technology products and services.
research and development	R&D	The R&D program for Census 2000 started in 1991 and ended in 1995.
research and experimentation	REX	The program of studies used to evaluate a census, to research new procedures and techniques, and to conduct experiments under true census conditions. For Census 2000, this program was referred to as Testing, Experimentation, and Evaluation.

Term	Abbreviation	Description
residence status		Each person in the coverage measurement sample block is assigned a residence status code identifying the person as either a resident or nonresident of the housing unit on Census Day.
Residential Finance Survey	RFS	This survey has been done every 10 years following the census since 1950. The survey collects information about the acquisition and financing of residential properties in the United States.
respondent		The person supplying survey or census information about his or her living quarters and its occupants.
restricted access building/secured building		An apartment building (that is, multiunit building) that can be entered only through doors that are locked to the public.
rural		Territory, population, and housing units not classified as urban constitute rural. The urban and rural classifications cut across other hierarchies; for example, there are generally both urban and rural territories within both metropolitan and nonmetropolitan areas.
rural delivery area		An area within which a post office delivers mail to residents living on rural delivery routes, as designated by the U.S. Postal Service. While many housing units in a rural delivery area use non-city-style addresses, some rural delivery routes include a substantial number that use house number and street name addresses. See city delivery area, city-style addresses, non-city-style addresses, and nondelivery area.
rural update/enumerate	RU/E	The enumerator attempts to update address lists and enumerate housing units for selected hard-to-enumerate rural areas. They also update and correct the census maps if needed.
sample census edited file	SCEF	A file containing 100 percent and sample characteristics for housing units and persons in the long-form sample. Processing for the SCEF includes merging the results of industry and occupation coding and place of work and migration coding, coding several other items, and weighting the long form responses.
sample census unedited file	SCUF	The decennial response file is combined with the decennial master address file to create the 100 percent census unedited file and the SCUF. The SCUF contains the unedited 100 percent items and sample items for all sample housing units and their residents and all sample persons in group quarters in Census 2000.
sample data		Detailed social, economic, and housing information collected on the long form from a selected portion of all housing units and people living in group quarters. The 1990 census sampled approximately 15 percent of the nation's population and 16 percent of its housing units. See 100 percent data.
sample edited detail file	SEDF	A file containing 100 percent and sample characteristics for housing units and persons in the long-form sample. The SEDF was used to create the Census 2000 sample data products and other tabulations based on the sample data.
sampling error		Errors that occur because only part of the population is directly contacted. With any sample, differences are likely to exist between the characteristics of the sampled population and the larger group from which the sample was chosen. Sampling error, unlike nonsampling error, is measurable.

Term	Abbreviation	Description
sampling stratum		A grouping or classification that has a similar set of characteristics based on the previous census.
school district	SD	A geographic area delineated by state, county, or local officials designating the school(s) that students in a particular locale must attend.
seasonal/recreational/occasional use		A housing unit held for occupancy only during limited portions of the year, such as a beach cottage, ski cabin, or time-share condominium.
self-enumerating places		Includes military facilities and group quarters, such as hospitals and prisons where the safety of the residents or the enumerators is a concern. A staff member of the facility lists the names of all people staying in each group quarters at the facility and prepares the Individual Census Report packets. A crew leader returns in a day or two to collect the completed materials. Note: Military Census Reports are used at military installations. See group quarters, Individual Census Report.
separate living quarters		Quarters in which the occupants live separately from any other individual in the building and which have direct access from outside the building or through a common hall. For vacant units, the criteria of separateness and direct access are applied to the intended occupants whenever possible.
service-based enumeration	SBE	An operation designed to enumerate people at service locations that primarily serve people without housing, such as emergency or transitional shelters; shelters for children who are runaways, neglected, or without conventional housing; shelters for abused women; soup kitchens; and regularly scheduled mobile food vans. The SBE also included enumeration at targeted nonsheltered outdoor locations. See service locations and targeted nonsheltered outdoor locations.
service locations		Locations where clients are enumerated during the service-based enumeration operation, such as emergency or transitional shelters; shelters for children who are runaways, neglected, or without conventional housing; shelters for abused women; soup kitchens; and regularly scheduled mobile food vans.
shelters for children who are runaways, neglected, or without conventional housing		Includes shelters/group homes that provide temporary sleeping facilities for juveniles. These are service locations. See emergency shelters; hotels, motels, or other facilities; regularly scheduled mobile food vans; service locations; soup kitchens; and transitional shelters.
Shipboard Census Report	SCR	A census questionnaire used for military and maritime (civilian) personnel aboard ships.
short form	SF	The decennial census questionnaire containing only the 100 percent questions. See 100 percent data, long form.
simplified enumerator questionnaire	SEQ	A questionnaire that enumerators use for transient, or T-Night, enumeration and when conducting the non-response follow-up. See nonresponse follow-up and T-Night enumeration.
single MIM-based integrated mapping system	SMIMS	A software system for creating the Map Image Metafiles (MIM).
Source Selection Evaluation Board	SEB	An evaluation group that evaluates proposals and selects the source for the contract award.

Term	Abbreviation	Description
soup kitchens		Includes soup kitchens, food lines, and programs distributing prepared breakfasts, lunches, or dinners. These programs may be organized as food service lines, bag or box lunches, or tables where people are seated, then served by program personnel. These programs may or may not have a place for clients to sit and eat the meal. These are service locations. See service-based enumeration.
special census		A federal census conducted at the request and cost of a local government to obtain population figures between decennial censuses.
special notice		A page in the address register to remind the enumerator of the confidentiality of the information being collected and to remind the enumerator to make legible entries.
special place	SP	A place containing one or more group quarters where people live or stay, such as a college or university, nursing home, hospital, prison, hotel, migrant and seasonal farm worker camp, or military installation or ship. See group quarters.
Special Place Facility Questionnaire	SPFQ	A questionnaire used to interview an official at a special place for the purpose of collecting/updating address information for the special place and any associated group quarters and housing units, determining the type of special place/group quarters, and collecting additional administrative information about each group quarters at the special place.
Special Place Facility Questionnaire operation		An operation where interviewers at telephone centers call each special place on the special place file and conduct computer-assisted telephone interviews to collect/update address information for the special place and any associated group quarters and housing units, determine the type of special place and any associated group quarters, and collect any additional information about each group quarters at the special place. If the interview cannot be completed by phone, an enumerator visits the facility to conduct the interview. See Special Place Facility Questionnaire.
special sworn status individual	SSS	Designation for a temporary employee hired to assist the Census Bureau on work authorized by Title 13 and subject to the same confidentiality requirements as regular Census Bureau employees. See confidentiality.
standard deviation		A measure of the dispersion of values in a frequency distribution from the average.
state		A type of governmental unit that is the primary legal subdivision of the United States. See governmental unit, state equivalent.
state certifying official	SCO	The official designated annually by the governor of each state and state equivalent to review and certify that the Census Bureau's inventory of local governmental units in that state is accurate and that the boundary changes were accomplished in accordance with state law. See Boundary and Annexation Survey.
state code		A two-digit code assigned by National Institute of Standards and Technology to identify each state and state equivalent. See census code, federal information processing standards code, geographic code.

Term	Abbrevia- tion	Description
state data center	SDC	A state agency or university facility identified by the governor of each state and state equivalent to participate in the Census Bureau's cooperative network for the dissemination of census data. An SDC also may provide demographic data to local agencies participating in the Census Bureau's statistical areas programs and may assist the Census Bureau in the identification and delineation of statistical areas.
state-designated American Indian statistical area	SDAISA	A new program offered by the Census Bureau to the states for state-recognized American Indian tribes without a land base. A state government liaison can review and update the boundaries for these geographic areas, and the Census Bureau provides data for these areas.
state equivalent		A type of governmental unit treated by the Census Bureau as if it were a state for purposes of data presentation. For Census 2000, the state equivalents included the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands of the United States, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. See governmental unit, Island Areas, state.
state legislative district	SLD	The area represented by a member of the upper or lower chamber of a state legislature (or, for Nebraska, its unicameral legislature).
statement of need	SON	A description of the services and/or final product solicited by the government. See statement of work.
statement of work	SOW	A description of the objectives and/or tasks required to be accomplished as a part of a request for proposals or in a contract for professional services. See statement of need.
statistical entity		Any specially defined geographic entity, such as a metropolitan area, urbanized area, tribal designated statistical area, census county division, census designated place, census tract, block group, or census block, for which the Census Bureau tabulates data. Statistical entity boundaries are not legally defined, and the entities have no governmental standing. See legal entity.
Statistical Research Division	SRD	Census Bureau. Conducts statistical and methodological research motivated by practical problems arising in all phases of data collection, processing, and dissemination.
street segment		The portion of a street or road between two features that intersect that street/road, such as other streets/roads, railroad tracks, streams, and governmental unit boundaries.
subbarrio		The primary legal subdivision of a barrio or barrio-pueblo (minor civil division) in 23 municipios in Puerto Rico. Census 2000 provides the same types of data for subbarrios as it does for barrios and barrios-pueblo. See sub-MCD.
sub-MCD		A legal subdivision of a minor civil division (MCD). For Census 2000, only Puerto Rico has sub-MCDs (subbarrios).
tabulation block		A physical block that does not have any legal or statistical boundaries passing through it OR each portion of a physical block after the Census Bureau recognizes any legal or statistical boundaries that pass through it. See block, block number, collection block.
tabulation geography		The geographic entities for which the Census Bureau tabulates and presents data, such as the United States, American Indian and Alaska Native areas, states, counties, county subdivisions, places, congressional districts, metropolitan areas, census tracts, and census blocks. See collection geography, geographic entity.

Term	Abbreviation	Description
targeted canvassing		Used in the Census 2000 Dress Rehearsal. Replaced by block canvassing.
targeted mailing		The mailing of replacement questionnaires is targeted to nonrespondents, that is, households that did not return a completed questionnaire by a certain time.
targeted map update		An operation where census employees (updaters) go into the field to find the city-style address ranges that the regional offices and regional census centers (RCCs) were unable to resolve during Automated Master Address File Geocoding Office Resolution. The updaters identify the streets and address ranges by annotating census maps and lists of uncoded address ranges. They return the maps and lists to the RCCs, and the RCCs insert the information into the TIGER® database and flag errors in the master address file. The computer matches and geocodes the addresses. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, census map preview, TIGER®, and TIGER® Improvement Program.
targeted multiunit check		Used in the Census 2000 Dress Rehearsal. Replaced by block canvassing.
targeted nonsheltered outdoor location	TNSOL	A geographically identifiable outdoor location open to the elements where there is evidence that people might be living without paying to stay there and those people do not usually receive services at soup kitchens, shelters, and mobile food vans. Sites must have a specific location description that will allow a census enumeration team to physically locate the site; for example, “the Brooklyn Bridge at the corner of Bristol Drive” or “the 700 block of Taylor Street behind the old warehouse.” Excludes pay-for-use campgrounds, drop-in centers, post offices, hospital emergency rooms, and commercial sites (including all-night theaters and all-night diners). See service-based enumeration.
targeting database		See planning database.
Technologies Management Office	TMO	Census Bureau. Develops and implements computer-assisted data collection and related support operations. Oversees the development of automated instruments for computer-assisted interviewing applications. Serves as liaison with production software contractors.
telephone follow-up	TFU	Telephone contact from a district office or a processing office to occupied housing units to complete or correct inadequate data for mail return questionnaires that failed the edit.
Telephone Questionnaire Assistance	TQA	A toll-free service that was provided by a commercial phone center to answer questions about Census 2000 or the census questionnaire and to conduct short-form telephone interviews.
Telephone Questionnaire Assistance field verification		An operation to verify the existence and the residential status of addresses given to the Census Bureau from the Telephone Questionnaire Assistance operation. Addresses verified by a field enumerator were added to the master address file.
tenure		All occupied housing units are classified as either owner-occupied or renter-occupied.
test census		A partial or complete census of population and housing that the Census Bureau conducts in selected areas prior to a decennial census to test the validity and effectiveness of a variety of operations, including alternatives.

Term	Abbreviation	Description
TIGER® Improvement Program	TIP	The TIGER® (Topologically Integrated Geographic Encoding and Referencing) Improvement Program provides all local governments and regional and metropolitan agencies the opportunity to assist the Census Bureau in locating and updating street features, street names, and address ranges identified as missing or incorrect in the TIGER® database. This information is needed to link U.S. Postal Service addresses with the TIGER® database. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, census map preview, digital exchange file, geocode, targeted map update, TIGER®.
TIGER/Line® file		The computer-readable extract of the TIGER® (Topologically Integrated Geographic Encoding and Referencing) database that the Census Bureau makes available to the public. It contains data representing the roads, railroads, bodies of water, boundaries of legal and statistical entities, and other visible and nonvisible features, along with their attributes (names, address ranges, geographic codes, census feature class codes, and the like).
Title 13 (U.S. Code)	T-13	The law under which the Census Bureau operates and that guarantees the confidentiality of census information and establishes penalties for disclosing this information.
tool kit		Special census methods and procedures available for improving cooperation or enumeration in hard-to-enumerate areas. These are not normally scheduled operations but are available to the Census Bureau regional offices for use as needed. Examples: targeting database, team and blitz enumeration, and urban update/leave.
Topologically Integrated Geographic Encoding and Referencing	TIGER®	A computer database that contains a digital representation of all census-required map features (streets, roads, rivers, railroads, lakes, and so forth), the related attributes for each, and the geographic identification codes for all entities used by the Census Bureau to tabulate data for the United States, Puerto Rico, and Island Areas. The TIGER® database provides a resource for the production of maps, entity headers for tabulations, and automated assignment of addresses to a geographic location in a process known as “geocoding.” TIGER® was preceded by the GBF/DIME (Geographic Base File/Dual Independent Map Encoding) files. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, census map preview, digital exchange file, geocode, targeted map update, TIGER® Improvement Program.
touchtone data entry	TDE	An automated data capture technology that allows a respondent, using the keypad of a touchtone telephone, to reply to computer-generated prompts.
town		A type of minor civil division in the New England states, New York, and Wisconsin and a type of incorporated place in 30 states and the Virgin Islands of the United States. See county subdivision, governmental unit, incorporated place.
township		A type of minor civil division in 16 states. In some states, many or all townships are nonfunctioning entities. In Michigan, some townships are legally designated as “charter townships.”

Term	Abbreviation	Description
tract		Small, relatively permanent statistical subdivisions of counties delineated by local committees of census data users in accordance with Census Bureau guidelines for the purpose of collecting and presenting decennial census data. These neighborhoods contain between 1,000 and 8,000 people, typically approximately 1,700 housing units and 4,000 people. Tracts are designed to have homogeneous population characteristics, economic status, and living conditions at the time they are established. Census tract boundaries normally follow visible features but may follow governmental unit boundaries and other nonvisible features. There were more than 60,000 census tracts in 2000. See statistical entity, census statistical areas committee.
tract number		Used to uniquely identify a census tract within a county.
traffic analysis zone	TAZ	An area defined by a metropolitan planning organization for tabulating transportation statistics from the census.
transient location		Includes living quarters with people who have no usual home elsewhere who were enumerated during Transient Night, or T-Night, enumeration at YMCAs, YWCAs, hostels, commercial and government-run campgrounds, campgrounds at racetracks, fairs, carnivals, and marinas. Census enumerators complete a simplified enumerator questionnaire for the residents who do not have a home elsewhere. These locations are classified as housing units.
Transient Night or T-Night, T-Night enumeration	T-NIGHT, TNE	A method of enumeration in which Census Bureau staff enumerate people at transient locations, such as campgrounds at racetracks, recreational vehicle campgrounds or parks, commercial or public campgrounds, fairs and carnivals, and marinas. Enumerators conduct a personal interview using a simplified enumerator questionnaire. No vacant units are generated by this operation. See simplified enumerator questionnaire, transient location.
transitional shelters		Includes shelters providing a maximum stay for clients of up to 2 years and offering support services to promote self-sufficiency and to help clients obtain permanent housing. These are service locations. See service locations.
tribal block group		A block group within a tribal census tract. Where a census tract numbered in the 9400 series crosses a county line, the same tribal block group may be located on both sides of that boundary. See block group, tribal census tract.
tribal census tract		A census tract or portion of a census tract located within a federally recognized American Indian reservation and/or off-reservation trust land. Thus, the boundary of a federally recognized American Indian reservation and off-reservation trust land is always a tribal census tract boundary. Some of these census tracts are numbered in the 9400 series, primarily where they cross a county line. See census tract, tribal block group.
tribal designated statistical area	TDSA	An area identified outside Oklahoma by federal- and state-recognized tribes without a land base or associated land trust.
tribal jurisdiction statistical area	TJSA	An area identified by Oklahoma tribal officials as containing the American Indian population over which they have jurisdiction.

Term	Abbrevia- tion	Description
Tribal Review Program		A program in 1997 and 1998 to allow officials of all federally recognized American Indian and Alaska Native entities to review and update the maps for Census 2000 for their jurisdictions. Other programs involving map review for the American Indian/Alaska Native areas include Address List Map Review, Block Definition Project, Boundary and Annexation Survey, census map preview, and Local Update of Census Addresses.
turnover rate		The total number of workers who quit during a field operation divided by the total number of workers hired for that operation.
type of enumeration area	TEA	A classification identifying how the Census Bureau takes the decennial census of a geographic area. Examples of possible TEAs include: <ul style="list-style-type: none"> ▪ The area inside the “blue line.” For 2000, this was the mailout/mailback and urban update/leave operations. ▪ Address listing areas. ▪ List/enumerate areas. ▪ Remote areas of Alaska. See address listing, blue line, list/enumerate, mailout/mailback, rural update/enumerate, update/leave, urban update/leave.
undeliverable as addressed	UAA	A U.S. Postal Service notification that a mailing piece could not be delivered to the designated address. Formerly called a postmaster return.
unorganized territory	UT	The portion of a county that is not included in any legally established minor civil division (MCD) or incorporated place in a state in which the Census Bureau recognizes MCDs for purposes of decennial census data presentation. For purposes of data presentation, the Census Bureau may divide a large area of unorganized land into several UTs. See county subdivision, statistical entity.
update/enumerate	U/E	A method of enumeration in which enumerators update the mailing list obtained by address listing and other operations, update census maps, and simultaneously enumerate the area. For enumeration, they canvass selected blocks and pick up completed, unaddressed questionnaires previously left by a mail carrier or complete a census questionnaire for each occupied and vacant housing unit. For Census 2000, the Census Bureau implemented this methodology primarily in areas designated for rural update/enumerate. See rural update/enumerate, type of enumeration area, update/leave.
update/leave	U/L	A method of data collection in which the objective is to update the address register while delivering questionnaires. Enumerators personally deliver a census questionnaire to a household and at the same time update the address list and census maps. The household completes and returns the form by mail. This method is primarily used for houses without city-style addresses. See address listing, city-style address, list/enumerate, mailout/mailback, non-city-style address, type of enumeration area, rural update/enumerate.
urban		All territory, population, and housing units in urbanized areas and in places of 2,500 or more persons outside urbanized areas. The urban and rural classifications cut across other hierarchies; for example, there are generally both urban and rural territories within both metropolitan and nonmetropolitan areas.

Term	Abbreviation	Description
urban cluster	UC	A densely settled area that has a census population of 2,500 to 49,999. A UC generally consists of a geographic core of block groups or blocks that have a population density of at least 1,000 people per square mile, and adjacent block groups and blocks with at least 500 people per square mile. It may include less densely settled blocks that form enclaves or indentations or that connect discontinuous areas that have qualifying densities. A UC consists of territory outside of any place; all or part of one or more incorporated places and/or census designated places; or such a place(s) together with adjacent territory. See central place, extended place, urban, urbanized area. NOTE: Any urban area delineated in Guam is classified as an urban cluster regardless of its population size.
urban growth area	UGA	In Oregon, an "urban growth boundary" is delineated around each incorporated place or a group of incorporated places by state and local officials, and subsequently confirmed in state law, to control urban development. The Census Bureau refers to the resulting geographic entities as "urban growth areas." UGAs were new for Census 2000. ("Urban growth boundary" is a legal term; "urban growth area" is a Census Bureau term.)
urban update/enumerate	UU/E	A method of enumeration within mailout/mailback areas in selected cities to enumerate blocks occupied almost entirely by boarded-up structures. The objective is to update the address register while delivering questionnaires. Enumerators complete a census questionnaire for each occupied and inhabitable housing unit, and update the address register and the census maps. The Census Bureau did not use this type of enumeration in Census 2000.
urban update/leave	UU/L	Update/leave procedures are used in targeted urban areas where mail delivery may be a problem, such as an apartment building where the mail carrier may leave the forms in a common area. Enumerators deliver census questionnaires for residents to complete and mail back, update the address register, and update the census maps.
urbanized area	UA	An area, consisting of one or more places and the adjacent urban fringe, containing at least 50,000 people and an overall population density of at least 1,000 people per square mile of land. The Census Bureau uses published criteria to determine the qualification and boundaries of UAs. See statistical entity.
U.S. Postal Service	USPS	The organization responsible for delivering the mail questionnaires in Census 2000 and the producer of the delivery sequence file.
usual home elsewhere	UHE	A housing unit that is temporarily occupied by a person(s) who has a usual home elsewhere.
usual residence		The living quarters where a person spends more nights during a year than any other place.

Term	Abbreviation	Description
vacant housing unit		A housing unit is vacant if no one is living in it at the time of enumeration, unless the occupants are only temporarily absent. Units temporarily occupied at the time of enumeration entirely by individuals who have a usual residence elsewhere are classified as vacant. (Transient quarters, such as hotels, are housing units only if occupied. Thus, there are no vacant housing units at hotels and the like.) New units not yet occupied are classified as vacant housing units if construction has reached a point where all exterior windows and doors are installed and final usable floors are in place. Vacant units are excluded from the housing unit inventory if they are open to the elements. Also excluded from the housing unit inventory are units with a posted condemnation sign or units that are used entirely for nonresidential purposes.
vacant housing unit follow-up		The verification of the occupancy status of all cases originally identified by either the U.S. Postal Service or an enumerator as addresses without occupants or addresses that are no longer housing units.
village		A type of incorporated place in 20 states and American Samoa. The Census Bureau also treats all villages in New Jersey, South Dakota, and Wisconsin and some villages in Ohio as county subdivisions. See governmental unit, incorporated place.
visible feature		A feature that can be seen on the ground, such as a street or road, railroad track, power line, stream, shoreline, fence, ridge, or cliff. A visible feature can be a manmade or natural feature. See feature.
voice recognition entry	VRE	An automated data capture technology that allows a respondent, speaking over a telephone, to reply to computer-generated prompts.
voting district/legislative district	VTD	Any of a variety of types of areas, such as election districts, precincts, wards, and legislative districts, established by state and local governments for purposes of elections.
Walk-In Questionnaire Assistance Center		Places, such as post offices, libraries, stores and malls, schools and community centers, and other sites people frequent, where unaddressed questionnaires, called Be Counted forms, were offered in an attempt to ensure everyone had the opportunity to be counted. The centers were staffed by volunteers and Census Bureau employees.
whole household usual home elsewhere	WHUHE	See usual home elsewhere.
wide area network	WAN	A group of computers linked within a network, such as the Census Bureau's regional offices, to exchange and share information. Whereas a "local area network" may link computers within a building or among several buildings, a WAN covers more area and distance. See local area network.
work breakdown structure	WBS	A way of organizing a project by a hierarchy of its components. The master activity schedule was organized by a WBS with 13 components or major programs. All Census 2000 program documentation and planning was keyed to this.
ZIP + 4		A 4-digit code following a 5-digit ZIP Code established by the U.S. Postal Service for the purpose of expediting mail delivery. The 9-digit code generally identifies one side of a street segment or an entire cul-de-sac or similar dead-end street.

Term	Abbreviation	Description
ZIP Code	ZIP	ZIP Codes are administrative units established by the U.S. Postal Service for the distribution of mail. ZIP stands for zone improvement plan. It is a 5-, 7-, 9-, or 11-digit code assigned by the U.S. Postal Service to a street or portion of a street, a collection of streets, a business, or other establishment or structure, or a group of post office boxes to expedite the delivery of mail. The Census Bureau used only 5-digit ZIP Codes for the addresses and address ranges in most Census 2000 operations.
ZIP Code area		The addresses served by a 5-digit ZIP Code established by the U.S. Postal Service to expedite the delivery of mail. Most ZIP Codes do not have specific boundaries, and their implied boundaries do not necessarily follow clearly identifiable visible or invisible map features; also, the carrier routes for one ZIP Code may intertwine with those of one or more other ZIP Codes, and therefore this "area" is more conceptual than geographic. See ZIP + 4, ZIP Code, ZIP Code tabulation area.
ZIP Code tabulation area	ZCTA	A statistical entity developed by the Census Bureau to approximate the delivery area for a U.S. Postal Service 5-digit ZIP Code in the United States and Puerto Rico. A ZCTA is an aggregation of one or more census blocks that have the same predominant ZIP Code associated with the mailing addresses in the Census Bureau's master address file. Thus, the Postal Service's delivery areas have been adjusted to encompass whole census blocks so that the Census Bureau can tabulate census data for ZCTAs. For areas larger than 25 square miles for which the Census Bureau's master address file contained no addresses with ZIP Codes, the Census Bureau used the first 3 digits of the ZIP Code(s) that serve the area or a nearby area. For the dress rehearsal data, there were two blank spaces after such 3-digit codes; for Census 2000, there was a suffix of "XX." A water feature that could not logically be assigned to a specific ZCTA got assigned a 3-digit code followed by "HH" to indicate that the water feature could not be assigned meaningfully to any adjacent land ZCTA. ZCTAs do not include all ZIP Codes used for mail delivery. The Census Bureau first created ZCTAs for the Census 2000 Dress Rehearsal. See ZIP Code, ZIP Code area.
zona urbana	ZU	In Puerto Rico, an area consisting of the municipio seat of government and the adjacent built-up area. ZUs are delineated like census designated places, except that ZUs cannot cross municipio boundaries. ZUs have never had to meet a minimum population threshold to qualify for tabulation of census data, a criterion that for Census 2000 applied for the first time to all census designated places. See census designated place, comunidad.

History

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2000 Census of Population and Housing

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Volume 2

Chapter 7: Census Geography and the Geographic Support System

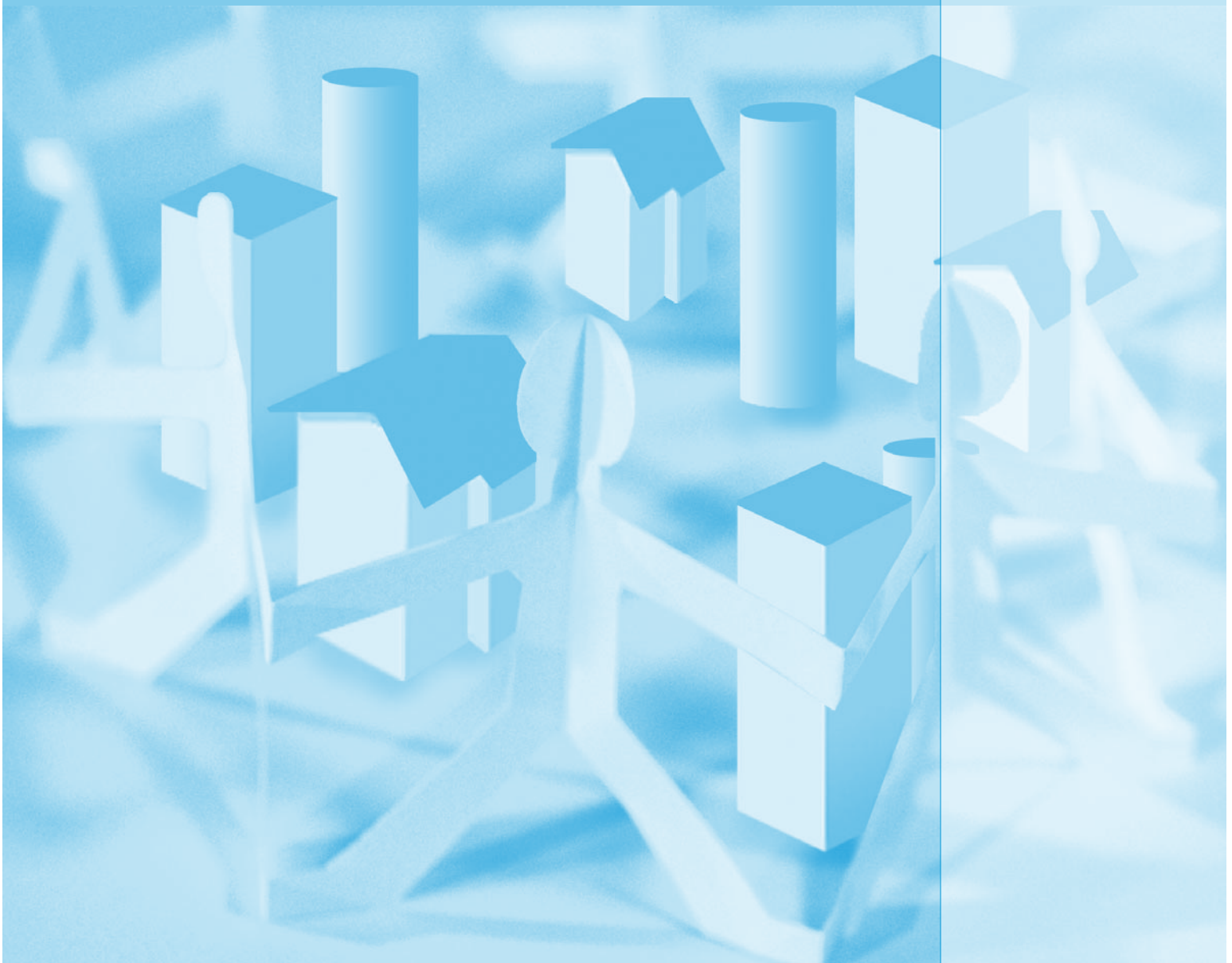
Chapter 8: Addresses and Questionnaire Printing and Mailing

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Chapter 10: Testing, Experimentation, Evaluation, and Coverage Measurement Programs

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Chapter 12: Puerto Rico and the Island Areas



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Volume 2: Preface

This volume includes the last six chapters of the *History: 2000 Census of Population and Housing*. These chapters present detailed descriptions of many aspects of Census 2000, from geographic support and address list preparation through the creation and dissemination of census data products, the evaluation and experimental programs, the resolution of census-related litigation, and the conduct of the census in Puerto Rico and the Island Areas.

Chapter 7, “Census Geography and the Geographic Support System,” describes the procedures the Census Bureau used to produce maps for data collection and tabulation purposes, as well as the operations undertaken to update and improve the TIGER® system. **Chapter 8, “Addresses and Questionnaire Printing and Mailing,”** describes the creation and maintenance of the master address file and its decennial census derivative file and summarizes the process of printing census questionnaires, inserting them into properly addressed envelopes, and delivering them to the correct addresses. **Chapter 9, “Data Products and Dissemination,”** describes the tabulation data files from which data products were created, the various series of data products, and the ways the Census Bureau disseminated census data to the public and to other government agencies. **Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs,”** reviews the goals and results of the experiments embedded in Census 2000 and the evaluations of the operations and procedures the agency conducted in the course of taking this census. **Chapter 11, “Legal Issues,”** describes census-related legislation, the disagreements over the uses of sampling in the census and how they were resolved, census-related Freedom of Information Act requests, and the lawsuits to which the census gave rise. **Chapter 12, “Puerto Rico and the Island Areas,”** discusses census operations and procedures in Puerto Rico and the Island Areas.

Volume 1 of this *History: 2000 Census of Population and Housing* covers such topics as the planning activities for the census, questions included on the census short form and census long form, programs that publicized the census and generated community partnerships, methods of distributing the census forms and collecting information, and the systems for reading and processing the data collected.

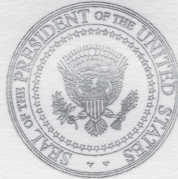
Volumes and Chapter Titles of the *History: 2000 Census of Population and Housing*

■ Volume 1

Chapter 1: The Context of Census 2000 *p. 3*
Chapter 2: Planning the Census *p. 27*
Chapter 3: Population and Housing Questions *p. 99*
Chapter 4: The Partnership and Marketing Program *p. 173*
Chapter 5: Data Collection *p. 215*
Chapter 6: Data Capture and Processing *p. 273*
Appendix A: Major Events in the Planning and Conduct of Census 2000 *p. A-1*
Appendix B: Census 2000 Regional Census Centers and Local Census Offices by
Regional Census Center Code Number *p. B-1*
Appendix C: Census 2000 Full Cycle Obligations, Budget Authority, and Appropriations *p. C-1*
Appendix D: Census 2000 Short (100 Percent) Form *p. D-1*
Appendix E: Census 2000 Long (Sample) Form *p. E-1*
Glossary

■ Volume 2

Chapter 7: Census Geography and the Geographic Support System *p. 317*
Chapter 8: Addresses and Questionnaire Printing and Mailing *p. 351*
Chapter 9: Data Products and Dissemination *p. 399*
Chapter 10: Testing, Experimentation, Evaluation, and Coverage Measurement
Programs *p. 447*
Chapter 11: Legal Issues *p. 517*
Chapter 12: Puerto Rico and the Island Areas *p. 595*
Appendix F: Overview of Congressional Hearings on Census 2000 Issues Held
by Oversight Committees and Subcommittees *p. F-1*
Appendix G: American Samoa Census Form *p. G-1*
Appendix H: Commonwealth of the Northern Mariana Islands Census Form *p. H-1*
Appendix I: Guam Census Form *p. I-1*
Appendix J: U.S. Virgin Islands Census Form *p. J-1*
Appendix K: Puerto Rico Census Form *p. K-1*
Glossary



Census Day, 2000

By the President of the United States of America

A Proclamation

Every 10 years, as mandated by our Constitution, all persons living in the United States are called upon to participate in the census. As the foremost method of gathering information about our Nation, the census plays a crucial role in helping us to maintain our democratic form of government.

An accurate census helps to ensure that the rights and needs of every person are recorded and recognized as we shape public policies, programs, and services. Too often in the past, children, minorities, and low-income individuals have not been counted and, as a result, have not been fully and fairly served. Census data are also used to determine the number of seats each State is allocated in the U.S. House of Representatives, and State and local governments depend upon these data to draw legislative districts that accurately represent their residents.

The census also serves as the basis for many public funding and private investment decisions. Census results play a part in determining the portion each State receives of more than \$185 billion in funds distributed by the Federal Government each year. State and local public officials use census data to decide where to build public facilities such as schools, roads, hospitals, and libraries. Census data also are a valuable resource for businesses that are trying to identify where to build stores, office buildings, or shopping centers.

The census is unique. It reaches every population group, from America's long-time residents to its most recent immigrants, and every age group from newborns to centenarians. The census touches every social class and every racial and ethnic group. The census is truly a democratic process in which we all can participate.

Census 2000 offers each of us an important opportunity to shape the future of our Nation. By taking part, we help ensure the well-being of our families and our communities, and we fulfill one of our fundamental civic duties. The U.S. Census Bureau has taken unprecedented steps to ensure full participation in this first census of the new millennium. At the same time, the Bureau will continue its long tradition of protecting the personal information of America's citizens, and no other Government agency will be able to see any individual or family census form. I strongly urge every man and woman living in the United States to fill out and return his or her census form or to cooperate with census takers who will help them do so.

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by virtue of the authority vested in me by the Constitution and laws of the United States, do hereby proclaim April 1, 2000, as Census Day. I call upon all the people of the United States to observe this day with ceremonies, activities, and programs that raise awareness of the importance of participating in Census 2000.

IN WITNESS WHEREOF, I have hereunto set my hand this first day of April, in the year of our Lord two thousand, and of the Independence of the United States of America the two hundred and twenty-fourth.

William J. Clinton

Chapter 7.**Census Geography and the Geographic Support System**

INTRODUCTION	317
CENSUS 2000 COOPERATIVE EFFORTS	317
Legal and Geographic Entities	321
Boundary and Annexation Survey (BAS)	321
Boundary Validation Program (BVP)	321
State Certification Program	321
Tribal Review Program	321
Changes for the legal entities	322
Redistricting Data Program	322
American Indian, Alaska Native, and Native Hawaiian Geographic Entities	326
American Indian reservations and off-reservation trust lands	326
Oklahoma tribal statistical areas (OTSAs)	326
Tribal Subdivision Program	326
Tribal designated statistical areas (TDSAs)	326
State American Indian reservations and state designated American Indian statistical areas (SDAISAs)	327
Alaska Native Regional Corporations (ANRCs)	327
Alaska Native Village Statistical Areas (ANVSAs)	327
Hawaiian Home Lands (HHL)	327
STATISTICAL GEOGRAPHIC ENTITIES	327
The Statistical Areas Programs Dialogue	327
Census Tracts and Block Groups	328
Census County Divisions (CCDs) and Census Designated Places (CDPs)	328
Participant Statistical Areas Program (PSAP)	329
Other Statistical Geographic Areas	329
Traffic analysis zones (TAZ)	329
Urban growth areas (UGAs)	330
ZIP Code tabulation areas (ZCTAs)	330
Metropolitan areas (MAs)	330
Urban/Rural	330
Public Use Microdata Areas (PUMAs)	331
Census Blocks	331
CENSUS 2000 COLLECTION GEOGRAPHY	332
Collection Blocks	332
Assignment Areas (AAs), Crew Leader Districts (CLDs), and Interim Census Tracts or Pseudo-Tracts	332
Types of Enumeration Areas (TEAs)	332
IMPROVING THE TIGER® SYSTEM	333
Evaluating the Use of Global Positioning System (GPS) Technology	334
The Lutherville Pilot Project	334
The Hampshire and Newberry Counties tests	335
GPS TIGER® accuracy analysis tools (GTAAT) evaluation	336
Impact of the tests of new technology	337
Programs to Update the TIGER® Database Prior to 2000	337
Update activities resulting from 1990 census operations	337
Field operations to update the TIGER® database	337
Improving consistency between the address control file (ACF) and the TIGER® database	338
Feature and Reference Source Assessment Survey (FARSAS)	338
TIGER® Improvement Program (TIP)	338
Master Address File Geocoding Office Resolution (MAFGOR)	338
Automated Master Address File Geocoding Office Resolution (AMAFGOR)	339
Targeted map update (TMU)	340

CONTENTS

Census map preview (CMP)	341
Address Listing Map Review (ALMR)	341
Geocoding Accuracy Assessment (GAA)	342
Automated Address Range Program (AARP)	342
Other Programs Affecting TIGER® Content	343
Updates from Census 2000 field operations	343
Special censuses	343
Census 2000 field test program	344
Census 2000 Dress Rehearsal	344
Precensus operations	344
The Use of Map Spots for Housing Units	345
Entering Map Updates Into the TIGER® Database	345
Geographic Products to Support the Census 2000 Field Operations	346
Census tests	346
Census 2000 Dress Rehearsal	348
Census 2000	348
Map Production	348

Chapter 7: Census Geography and the Geographic Support System

INTRODUCTION

Improvements related to an array of geographic issues were critical to the success of Census 2000. As in previous censuses, geographic programs supported the planning of operations, including address listing and data collection activities, the creation of the maps for census operations, and the tabulation and dissemination of data. The development of an all-inclusive, automated address list that was linked to a geographic database facilitated the Census Bureau's effort to take a complete and accurate census of an ever-expanding population in the most effective and cost-efficient manner. The result was a variety of geographic-area tabulations and products for the nation.¹

One of the Census Bureau's main goals was to improve the Topologically Integrated Geographic Encoding and Referencing (TIGER®) system and the products derived from it. The agency also expanded and enhanced the address list (called the master address file or MAF) to provide as complete a set of addresses as possible prior to the mail-out of questionnaires for most of the United States and to accurately associate every address with a geographic location in the TIGER database.² In addition, the Census Bureau continued to maintain and refine its map production processes and to identify and delineate geographic entities for which it collected and provided data.

Advances in technology changed the mode of operation for the Census 2000 geographic programs. Program information, materials, and products were posted to the Census Bureau's Internet site. This provided the Census Bureau with a new way to disseminate information to its partners. In addition, many programs offered both electronic and paper response options, enabling data users to choose the format of items they requested from geographic and address list programs.

This chapter describes the geographic entities included in Census 2000 and the Census 2000 geographic programs and geographic products. It also summarizes the differences between the 1990 and 2000 geographic operations.

CENSUS 2000 COOPERATIVE EFFORTS

The Census Bureau consulted with a number of governmental and nongovernmental groups and organizations as part of establishing and conducting the Census 2000 geographic programs. State, local, and tribal governments were consulted, as well as organizations with representatives from those governments, such as the National Association of Counties, National Association of Towns and Townships, National Conference of State Legislators, National League of Cities, National States Geographic Information Council, and all of the Census Advisory Committees.

The Census Bureau also met with numerous professional groups and attended or gave presentations at professional conferences across the country to provide information and obtain comments and suggestions about proposed Census 2000 geographic programs. Among those consulted were the Urban and Regional Information Systems Association, Intertribal Geographic Information Systems Conference, National Association of Towns and Townships Conference, Environmental Systems Research Institute Conference, Minnesota GIS/LIS Conference, National Association of

¹ Geography products include the Census Bureau's geographic support system, a variety of census-related maps, and the geographic entities used in and tabulated by the decennial census. Note that "Map Image Metafile," "MIM," "TIGER," and "TIGER/Line," are registered trademarks of the Census Bureau; "ZCTA" is a trademark of the Census Bureau; and "ZIP Code" and "ZIP+4" are registered trademarks of the U.S. Postal Service.

² See, for example, U.S. Census Bureau, "Census 2000 Operational Plan," December 2000, Section VII, and Andrew A. White and Keith F. Rust (eds.), *Preparing for the 2000 Census* (Washington, DC: National Academy Press, 1997), pp. 13–23.

Counties Conference, League of Cities Conference, International City/County Management Association Conference, and State Data Centers. The purpose here was to highlight how cooperative participation in programs like TIGER®, MAF, and geographic areas delineation could benefit both the Census Bureau and tribal, state, and local organizations.³

Legal and statistical geographic entities provided the framework for the collection, tabulation, and presentation of the Census 2000 data. Figures 7-1 and 7-2 show the entities for which the Census Bureau tabulated data. These entities are defined in the glossary or technical documentation that accompanied the published or tabulated census data.⁴

³ Refer to <<http://www.census.gov/geo/www/partnership.html>> for more information. See also Chapter 4, “The Partnership and Marketing Program.”

⁴ See <<http://www.census.gov/geo/www/tiger/glossary.pdf>>. Most of these entities are described in the geographic appendix (Appendix A) to Census 2000. A detailed explanation and the history of many of the areas for which Census 2000 reported data are available in the Census Bureau’s *Geographic Areas Reference Manual* (Washington, DC: Government Printing Office, 1994), <<http://www.census.gov/geo/www/garn.html>>.

Figure 7-1.
Standard Hierarchy of Census Geographic Entities

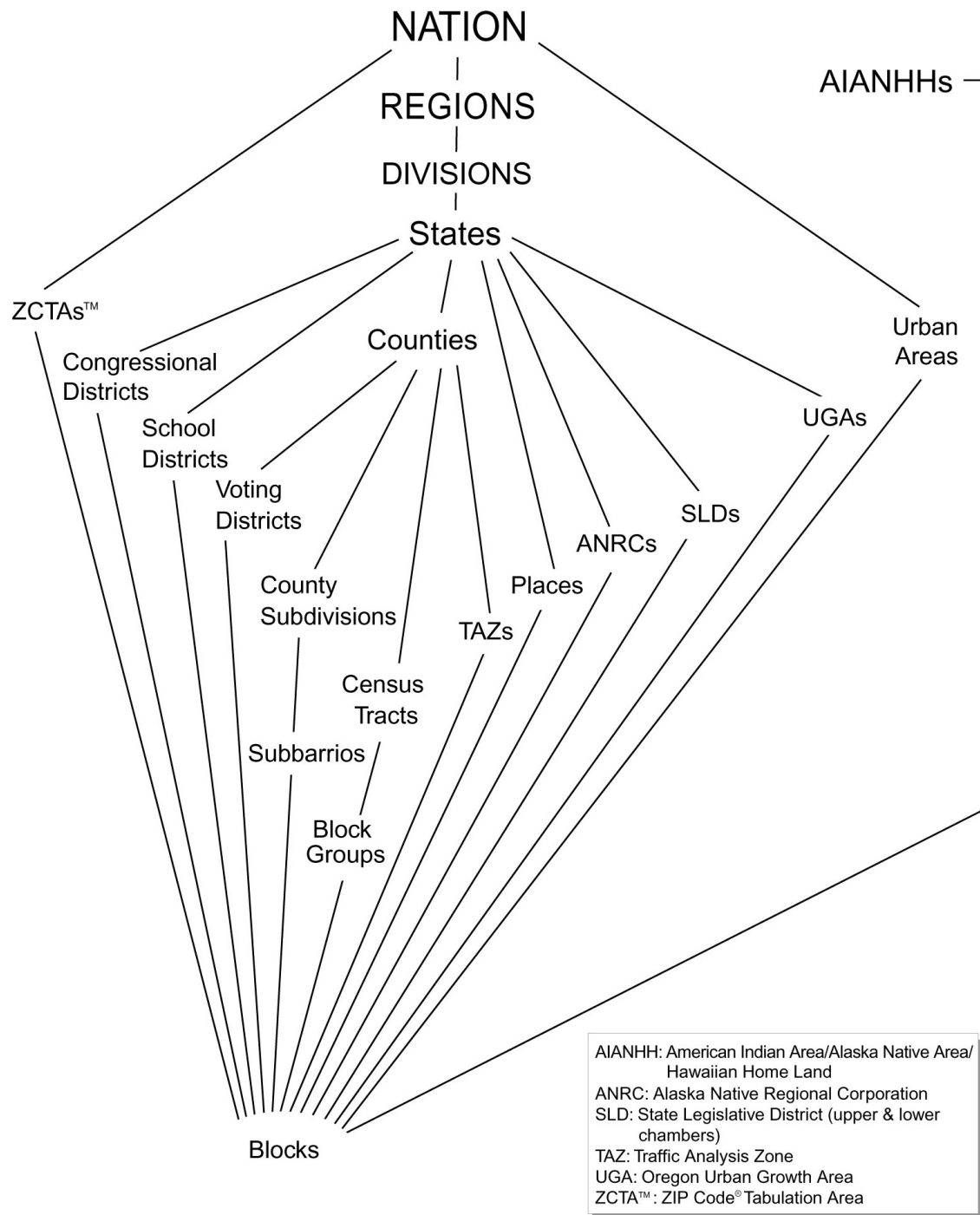
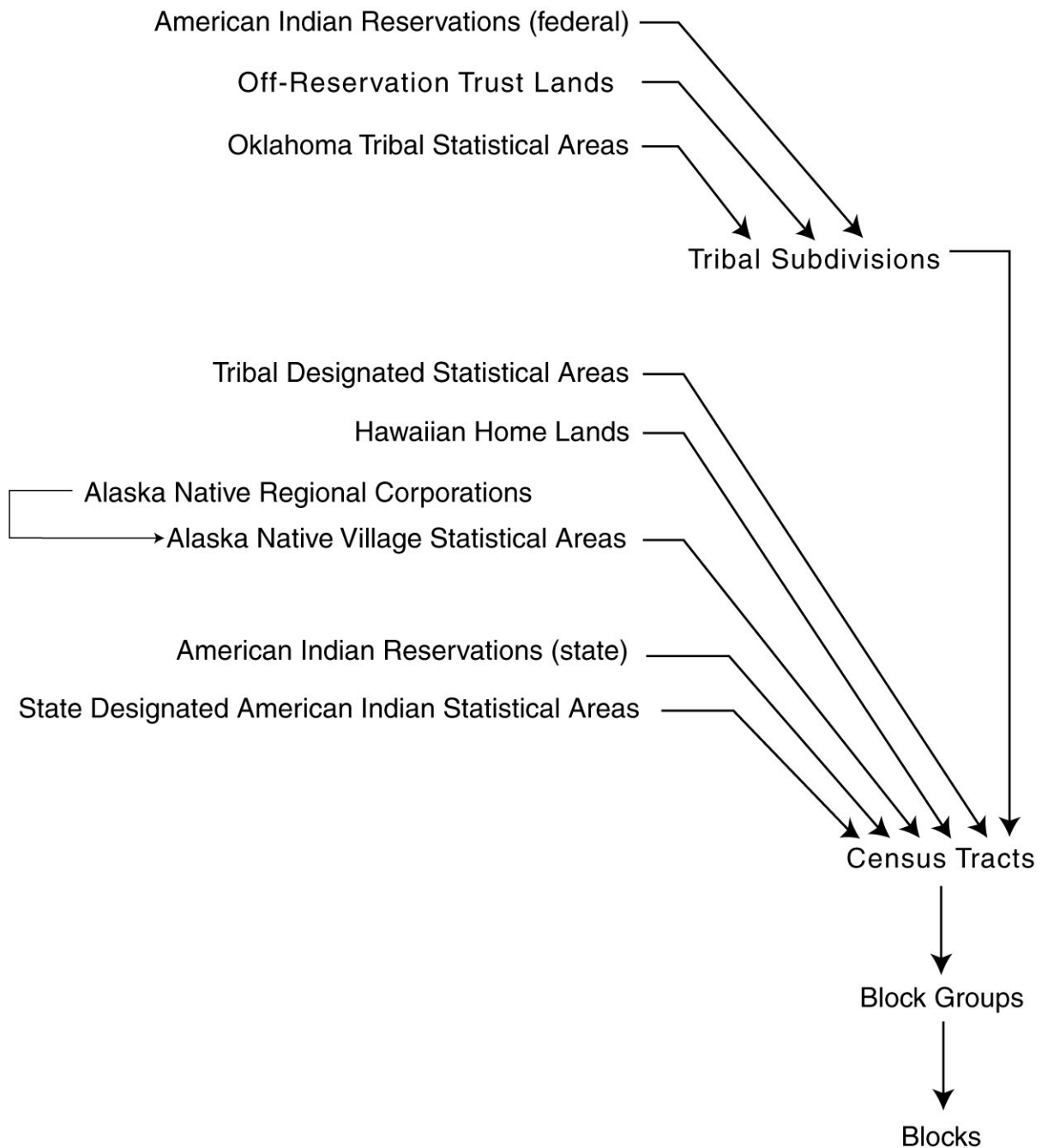


Figure 7-2.

American Indian Area/Alaska Native Area/Hawaiian Home Land Hierarchy



Legal and Geographic Entities

In Census 2000, the Census Bureau recognized legal entities and their boundaries legally in effect on January 1, 2000. This continued the agency's practice, first used for the 1970 census, of using January 1 as the basis for review and assignment of addresses and data tabulation. The types of legal entities for which the Census Bureau tabulated data were extensive and included the nation, states, counties/equivalent areas, minor civil divisions (MCDs), sub-MCDs, consolidated cities, incorporated places, congressional districts, state legislative districts, voting districts, American Indian reservations and/or off-reservation trust lands, Alaska Native Regional Corporations (ANRCs), tribal subdivisions, and Hawaiian Home Lands.

The Census Bureau used six geographic programs to collect and verify boundary data on legal entities. These programs (Boundary and Annexation Survey, Boundary Validation Program, State Certification Program, Tribal Review Program, Changes for the Legal Entities, and Redistricting Data Program) are discussed below.⁵

Boundary and Annexation Survey (BAS). The Boundary and Annexation Survey (BAS) was used to gather information about all counties and equivalent areas, MCDs, incorporated places, consolidated cities, American Indian reservations and off-reservation trust lands, ANRCs, and tribal subdivisions. Such information included boundary changes, mergers and consolidations, newly established and discontinued entities, and name and status changes.

Federally recognized American Indian tribes with a reservation or with off-reservation lands were included in the BAS, starting in 1998. The Census Bureau requested local and tribal officials with jurisdiction over these lands to update legal boundaries and to verify or correct the locations and names of streets and other base features shown on the maps. The 1999 BAS included ANRCs, which enabled Alaskan officials to review names and boundaries as recorded in the TIGER® database.

Boundary Validation Program (BVP). The 2000 BAS was the last survey mailed before delivery of Census 2000 questionnaires. Once this survey was completed, the Census Bureau conducted the Boundary Validation Program. This was a new program for Census 2000 and was the last opportunity for officials of governmental units (GUs) to review the legal boundaries before the tabulation of Census 2000 data.

The Census Bureau conducted an intensive mail and telephone follow-up program for GUs that did not respond to either the 2000 BAS or the BVP. The Customer Liaison Office (CLO) served as the agency's liaison with the State Data Centers (SDCs). Although their participation was voluntary, all SDCs participated. The CLO reported that some SDCs even offered to perform follow-up for local nonresponding GUs. The SDCs also urged GUs to respond to the BVP and notified them that if they did not respond because boundaries were accurate, they could report this to the local SDC, which would relay that information to the Census Bureau. This was a valuable service because the SDCs obtained responses from GUs that the Census Bureau could not reach.⁶

State Certification Program. After each BAS, the Geography Division (GEO) sent a list of the changes submitted for each geographic entity in the state, together with lists of all GUs in the state, to a governor-appointed state official for certification. These officials were asked to review the information for completeness and accuracy and to verify that all actions had taken place in conformance with state law. The Census Bureau required that all information about the entities included in the BAS reflect the legal situation as it existed on January 1 of the survey year so that the tabulated data for Census 2000 reflected the inventory of legal areas and boundaries in effect on that date.

Tribal Review Program. In addition to the BAS, the Census Bureau undertook a separate survey early in 1997—the Tribal Review Program—to determine the official boundaries and names of all federally recognized American Indian tribes with a land base; that is to say those tribes that,

⁵ See Chapter 9, "Data Products and Dissemination," for more information on the Redistricting Data Program.

⁶ Refer to <<http://www.census.gov/geo/www/partnership.html>> for more information.

according to the U.S. Bureau of Indian Affairs (BIA), had a reservation and/or off-reservation trust land recognized by the federal government.⁷ As part of the Tribal Review Program, selected tribes were offered the opportunity to identify features they wanted the Census Bureau to hold or not hold as tabulation block boundaries for the Block Definition Project. The tribes with an American Indian reservation and/or off-reservation trust lands became part of the BAS in 1998.

Changes for the legal entities. Section 191 of Title 13, U.S. Code, specified that the following areas be included in the decennial census as: “. . . each State, the District of Columbia, the Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, and the Commonwealth of Puerto Rico” Inclusion of other areas required concurrence of the U.S. Secretary of State. On March 6, 1995, the U.S. State Department announced that Census 2000 would not include the Republic of Palau, which became independent of the United States on October 1, 1994.⁸ This left American Samoa and a number of small, mostly unpopulated islands in the Caribbean Sea and the Pacific Ocean in the census by special agreement with the Department of State. Previously, the Census Bureau referred to the areas outside the United States collectively as Puerto Rico and the Outlying Areas, but for Census 2000 it adopted the more descriptive term of Island Areas to identify the latter entities collectively.

At the county level, the Census Bureau recognized two new types of legal entities in Alaska: “city and borough” and “municipality.” The latter term applied only to Anchorage. Alaska established two new county-level entities in the 1990s: Denali Borough and Yakutat City and Borough. The creation of the latter from part of the Skagway-Yakutat-Angoon Census Area caused the Census Bureau to rename the remaining portion as Skagway-Hoonah-Angoon Census Area.

Two legal entities that served as statistical equivalents of counties for the 1990 census relinquished that status during the decade. In 1995, South Boston, VA, gave up its status as a city independent of any county by joining the surrounding Halifax County. In 1997, the portion of Yellowstone National Park in Montana, which had not been part of any county, was absorbed into the two adjacent counties, Gallatin and Park.⁹ The creation and deletion of county-level entities resulted in the 1990 and 2000 count of the entity types remaining at 3,141.

The types of MCDs recognized for Census 2000 remained constant. But the number of governmental and administrative MCDs decreased from 24,861 to 24,787 as a result of mergers and redistricting in states where MCDs represented election districts. The BAS recorded changes to over 1,300 MCDs consisting of at least 1 square mile. The number of incorporated places increased from 19,289 in 1990 to 19,452 in 2000. The BAS revealed that roughly 88,500 annexations added territory to incorporated places between 1990 and 2000; incorporated places detached territory roughly 1,350 times. The BAS reported a net gain of about 12,780 square miles by incorporated places during the period.

Tables published by the Census Bureau presented only the Federal Information Processing Standards (FIPS) 55 codes for county subdivisions, sub-MCDs (the subbarrios in Puerto Rico), and consolidated cities and places. Other FIPS publication codes used were FIPS 5 for states and equivalent areas, FIPS 6 for counties and equivalent areas, FIPS 8 for metropolitan areas, and FIPS 9 for congressional districts. The Census Bureau or local participants provided codes for other tabulated areas.

Redistricting Data Program. Public Law (P.L.) 94-171 requires the Census Bureau to provide state governments with decennial census data for “geographic areas for which specific tabulations of population are desired” to assist states in meeting the one-person, one-vote requirement specified in the law. The areas under consideration usually correspond to or approximate voting areas

⁷ *Federal Register*, Vol. 65, No. 121 (June 22, 2000), pp. 39062–69. See, U.S. Census Bureau, *Geographic Areas Reference Manual*, 1994, pp. 5-10–5-11. See also U.S. Census Bureau, Geography Division, “Operational Plan for American Indian and Alaska Native Geographic Programs,” October 30, 1996, p. 5.

⁸ U.S. Census Bureau, Decennial Management Division, “Geographic Areas for Inclusion in the 2000 Decennial Census,” March 28, 1995.

⁹ Refer to <<http://www.census.gov/geo/www/tiger/ctychng.html#2000>> for more information.

or local legislative districts. P.L. 94-171 required the Census Bureau to provide state officials with the appropriate data from Census 2000 by April 1, 2001.¹⁰

The Census 2000 Redistricting Data Program had three phases. Phase 1 was the Block Boundary Suggestion Project (BBSP); Phase 2 was the Voting District Project (VTDP); and Phase 3 was the release of Census 2000 redistricting data.

The BBSP enabled appropriate officials in the 50 states to identify selected features as must-hold block boundaries. Similar programs were developed for specific American Indian lands (federal American Indian reservations, off-reservation trust land, and 1990 census tribal jurisdiction statistical areas), the District of Columbia, and Puerto Rico. The District of Columbia program was called the Block Definition Project (BDP), and the Puerto Rico program was the Block Boundary Definition Project (BBDP). American Indian tribes conducted a BDP in 1997 as part of the Tribal Review Program.

In Phase 2, the VTDP, state officials delineated local voting districts and state legislative districts (SLDs) for both the upper and lower chambers of each state's legislature.

Phase 3 was the Census Bureau's delivery of the Census 2000 Redistricting Data (P.L. 94-171) Summary File. Data delivery began on March 12, 2001, and included the maps and/or the TIGER/Line® files that identified names, boundaries, and relationships of census geography down to the block level. The summary file contained detailed race and Hispanic-origin data for redistricting; data on geographic areas (voting districts, SLDs, and congressional districts); and breakdowns by state, county, county subdivision, place, American Indian areas, Alaska Native areas, Hawaiian areas, census tracts, and blocks.

The congressional districts (CDs) for which Census 2000 first presented data were those reported as the districts that existed for the 106th Congress—the congressional session that began in January 1999—and therefore in effect on January 1, 2000, the official date for the boundaries recognized for Census 2000.

The first Congress to reflect the effects of reapportionment and redistricting resulting from Census 2000 was the 108th, which began in January 2003. The Census Bureau provided Census 2000 data based on the congressional district boundaries that the states reported legally in effect for the November 2002 elections. Census 2000 marked the first time the Census Bureau provided states with state legislative district data. States could identify their legislative districts as part of Phase 2 of the Redistricting Data Program.

¹⁰ U.S. Census Bureau, "Strength in Numbers/Your Guide to Census 2000 Redistricting Data From the U.S. Census Bureau," July 2000, <<http://www.census.gov/rdo/data/009919.html>>. Also refer to <<http://www.census.gov/rdo/222/2000%20redistricting%20data%20program.htm>>.

Table 7-1.
Geographic Tabulation Entities for Census 2000: Standard

Entities	Number of U.S. entities	Number of U.S., Puerto Rico, and Island Areas entities
United States	1	1
Census regions	4	14
Census divisions	9	19
State-level entities ²	51	56
States	50	50
District of Columbia	1	1
Puerto Rico and the Island Areas ³	(NA)	5
County-level entities	3,141	3,232
Counties, parishes, municipios, and similar entities (includes state-level entities that also serve as county-level entities [DC, Guam])	3,087	3,178
Independent cities	43	43
Census areas (Alaska only)	11	11
County subdivisions	35,414	36,427
Minor civil divisions (MCDs)	29,388	30,361
Governmentally active MCDs	16,567	16,581
Governmentally inactive or nonfunctioning MCDs	8,206	9,163
Places treated as MCD equivalents ⁴	4,597	4,599
American Indian reservations treated as MCD equivalents	18	18
Water-only MCD-equivalent areas (MCD records 00000)	97	137
Unorganized territories	305	305
Census county divisions	5,588	5,588
Census subareas (Alaska only)	36	36
Sub-MCDs (subbarrios in Puerto Rico)	(NA)	145
Places	25,157	25,512
Incorporated places (includes 7 consolidated city "balances")	19,452	19,528
Consolidated cities	7	7
Census designated places (CDPs) ⁵	5,698	5,977
Representation in congress ⁶	436	441
Congressional districts	435	435
Nonvoting delegates/resident commissioner (area coded 98)	⁶ 1	⁶ 5
No representation in Congress (area coded 99)	NA	⁶ 1
State legislative districts ⁷	5,112	5,112
Upper chamber districts ⁸ (includes 8 undesignated areas treated as upper chamber districts (districts coded ZZZ) ⁹	1,536	1,536
Lower chamber districts (includes 8 undesignated areas treated as lower chamber districts (districts coded ZZZ) ⁹	3,576	3,576
Voting districts ⁷ (includes 118 U.S. and 156 total undesignated areas treated as voting districts (districts coded ZZZZZZ) ⁹	127,605	129,319
School districts	14,404	14,409
Elementary ¹⁰	2,703	2,703
Secondary ¹⁰	472	472
Unified (includes 36 areas treated as unified districts [districts coded 99997 or 99998]) ⁹	11,127	11,132
Other (in 5 states) ¹⁰	102	102
Urban growth areas (Oregon only)	216	216
Metropolitan areas (MAs) ¹¹		
Metropolitan statistical areas (MSAs)	258	261
Consolidated MSAs (CMSAs)	18	19
Primary MSAs (PMSAs)	73	76
New England County MAs (NECMAs)	12	12
Central cities of metropolitan areas ¹¹	¹¹ 542	¹¹ 554
Central cities of MSAs	408	411
Central cities of CMSAs/PMSAs	134	143
Central cities of NECMAs	¹¹ 45	¹¹ 45

See footnotes at end of table.

Table 7-1.
Geographic Tabulation Entities for Census 2000: Standard—Con.

Entities	Number of U.S. entities	Number of U.S., Puerto Rico, and Island Areas entities
Urban areas ¹²	3,610	3,638
Urbanized areas (UAs)	452	465
Urban clusters (UCs)	3,158	3,173
Central places in urban areas	¹³ 3,996	¹³ 4,042
Central places in UAs	878	906
Central places in UCs	3,155	3,173
Census tracts ¹⁴ (includes 122 U.S. and 160 total water-only census tracts (census tracts numbered 0000 [or 000000])	65,443	66,437
Block groups (BGs) ¹⁴ (includes 122 U.S. and 160 total water-only block groups (BGs numbered 0) ¹⁵	208,790	211,826
Census blocks (includes 187,845 U.S. and 189,454 total water-only census blocks)	8,205,582	8,269,129
ZIP Code tabulation areas (ZCTAs)	33,048	33,178
5-digit ZCTAs	31,913	32,038
5-character generic ZCTAs (ZCTAs numbered nnnXX) ¹⁶	329	331
5-character water-only ZCTAs (ZCTAs numbered nnnHH) ¹⁶	806	809
3-digit ZCTAs ¹⁶	884	887
Traffic analysis zones (includes 112 areas treated as traffic analysis zones (zones coded ZZZZZ) ⁹	166,747	166,747
Public use microdata areas (PUMAs) ¹⁷		
5-percent-sample PUMAs	2,071	2,101
1-percent-sample PUMAs (super-PUMAs)	532	540

¹ Puerto Rico and the Island Areas are not part of any census region or division. For recordkeeping purposes, the Census Bureau codes them to a "false" region (9) and division (0), but the Census Bureau does not present data for "Region 9" and "Division 0," nor do they appear in the TIGER/Line® files.

² Does not include the U.S. Minor Outlying Islands (FIPS state code 74). The nine component entities are shown only in Table 1 of the "Census 2000 U.S. Summary Report." Only Midway Islands (FIPS county code 300) appears in the Census 2000 version of the TIGER/Line® files; however, it is not included in the post-census (2002 and subsequent) TIGER/Line files. Even though they appear in the Census 2000 files, counts for Midway Islands are not included in this table for the following geographic entities: state (1), county (1), county subdivision (1), school district (2), census tract (1), block group (1), and census block (2).

³ The Island Areas include American Samoa, Guam, the Northern Mariana Islands, and the Virgin Islands of the United States.

⁴ Includes multiple records for places in more than one county; also includes false MCD records for Arlington County, Virginia; and Rose Island and Swains Island, American Samoa.

⁵ CDPs include zonas urbanas and comunidades in Puerto Rico.

⁶ Includes one nonvoting delegate each for the District of Columbia, American Samoa, Guam, and the Virgin Islands of the United States, and a resident commissioner for Puerto Rico. In addition, the Census Bureau's internal files record the fact that the Northern Mariana Islands has no representation in Congress.

⁷ Includes only legislative districts and voting districts identified by officials in states that participated in the Census 2000 Redistricting Data Program, and officials in the District of Columbia and Puerto Rico.

⁸ Upper chamber districts include Nebraska's unicameral districts.

⁹ Refers to territory that was not assigned to any district or zone (no more than one per county) in a participating state. In many cases, the territory consists only of water area.

¹⁰ The "other" category consists of 43 high school service areas (recorded as secondary districts) and groupings of these areas into 7 administrative districts (recorded as elementary districts) in Hawaii; 32 community school districts (recorded as elementary districts) in New York city; and 1 district in Massachusetts, 2 districts in South Carolina, and 17 districts in Tennessee that represent 20 unified school districts that are also shown as 20 secondary districts (using pseudo school district codes) for purposes of data tabulation.

¹¹ All MAs and their central cities for Census 2000 are those in effect on January 1, 2000, as announced by the federal Office of Management and Budget (OMB) on June 30, 1999. The central cities included in NECMAs are the same central cities included in MSAs and CMSAs/PMSAs, and therefore the NECMA counts should not be added to the other central city counts. The MAs and central cities do not reflect the entities that the OMB announced in 2003 based on new standards (published December 27, 2000) and data from Census 2000.

¹² In August 2002, the Census Bureau revised the inventory of urban areas after data tabulation, resulting in the following counts: Urban areas: 3,607 (United States); 3,634 (United States, plus Puerto Rico and Island Areas) Urbanized areas: 453; 465 Urban clusters: 3,154; 3,169 Central places in urban areas: 4,030; 4,074 Central places in urbanized areas: 879; 906 Central places in urban clusters: 3,151; 3,168

¹³ Because a place that is identified as a central place can be located in more than one UA and/or UC, the total number of central places is smaller than the sum of central places in individual urban areas.

¹⁴ Tribal census tracts and tribal block groups provide coverage at these geographic levels for selected American Indian reservations and off-reservation trust land, without regard to state or county boundaries. All territory included in a tribal census tract also is included in a nontribal census tract and block group; where a tribal census tract crosses a state or county line, the portion in each county represents a separate nontribal census tract. Similarly, a tribal block group that crosses a state or county line is tallied as a separate nontribal block group in each county. The two sets of numbers presented in this table one set for tribal entities and one for all entities are independent of each other, and must not be added together.

¹⁵ BGs numbered 0 occur only in census tracts numbered 0000 (or 000000).

¹⁶ For areas generally larger than 25 square miles for which the Census Bureau did not have sufficient information to determine 5-digit ZIP Codes, it used a generic 5-character ZCTA code consisting of the first 3 digits of the 5-digit ZIP Code(s) that served the area or nearby area(s), followed by a suffix of XX for land and land-and-water areas and HH for water-only areas. The 3-digit ZCTAs represent summations of data for areas based on the first 3 digits of the 5-digit/5-character ZCTAs.

¹⁷ The counts do not include the one 10-percent PUMA each for Guam and the Virgin Islands of the United States.

American Indian, Alaska Native, and Native Hawaiian Geographic Entities

The Census Bureau provided census data for several types of geographic entities, both legal and statistical, that covered areas under the authority of American Indians, Alaska Natives, and Native Hawaiians. The Census Bureau's relationship with federally recognized American Indian tribes was based on the "Government-to-Government Relations With Native American Tribal Governments" memorandum issued on April 29, 1994.¹¹ The American Indian and Alaska Native Areas (AIANAs) Geographic Program for Census 2000 final criteria were published in the *Federal Register* on June 22, 2000.¹² The following sections explain the agency's Census 2000 operations for these entities.

American Indian reservations and off-reservation trust lands. In the fall of 1995, the Census Bureau and the BIA signed a memorandum of understanding establishing a boundary review procedure for Census 2000 that differed from that in place for the 1990 census.¹³ The new procedure directed the Census Bureau to request that only tribal governments review and update the boundaries associated with a tribe. In the past, the BIA provided all the boundaries. Under the new understanding, the Census Bureau consulted with the BIA in this matter only to resolve conflicting claims.

In 1997, as noted above, the Tribal Review Program allowed certain American Indian tribes to review and revise the boundaries recorded in the TIGER® database. Federally recognized tribes with a reservation and/or off-reservation trust lands were included in the BAS beginning with the 1998 survey.

The Census Bureau modified its terminology for two entities: "tribal jurisdiction statistical area" became "Oklahoma tribal statistical area," and "joint area" was changed to "joint use area." Joint use area was expanded to include not only overlapping adjacent reservations and Oklahoma tribal statistical areas, but also one tribe's off-reservation trust land that was located within the boundary of another tribe's reservation.

Oklahoma tribal statistical areas (OTSAs). These statistical entities generally conformed to the boundaries of former reservations in Oklahoma. (All but the Osage Reservation were dissolved in the 2 or 3 years before Oklahoma attained statehood in 1907.) This enabled the federally recognized tribes in Oklahoma that did not have legally defined land bases—i.e., all but the Osage Tribe—to delineate areas corresponding to their former reservation boundaries for statistical data presentation purposes. The Census Bureau referred to these entities as tribal jurisdiction statistical areas in the 1990 census. The designation was changed to OTSA late in 1999 to avoid the perception that these statistical entities reflected a legal status.

Tribal Subdivision Program. In the 1980 census, the Census Bureau collected data for the legal subdivisions of 21 federally recognized American Indian reservations, based on boundaries provided by the tribes; these subdivisions were referred to as American Indian subreservation areas. The 1990 census did not include these entities, but tribal governments requested that they be recognized again for Census 2000. Accordingly, the Census Bureau offered the tribal subdivision program to federally recognized tribes who owned a reservation and/or off-reservation trust lands as well as to those Oklahoma tribes that defined an OTSA. The subdivision boundaries could encompass only the area within a reservation and/or off-reservation trust land, or an OTSA.¹⁴

Tribal designated statistical areas (TDSAs). TDSAs were statistical entities delineated for Census 2000 by federally recognized tribes (outside of Oklahoma) that lacked a legally defined land base. They were designed to encompass areas containing a concentration of tribal members and on which tribes conducted structured activities. The policy of considering TDSAs to comprise

¹¹ *Federal Register*, Vol. 59, No. 85 (May 4, 1994).

¹² *Federal Register*, Vol. 65, No. 121 (June 22, 2000), pp. 39062–69.

¹³ U.S. Census Bureau, Geography Division, "Memorandum of Understanding Between the Bureau of Indian Affairs and Bureau of the Census," February 28, 1996, and "Operational Plan for American Indian and Alaska Native Geographic Programs," October 30, 1996, p. 2.

¹⁴ U.S. Census Bureau, "Tribal Subdivision Program Implementation," Boundary and Annexation Survey 2000/Chapter 1, Document 17, November 15, 1999.

only federally recognized tribes marked a change from 1990, when both state and federally recognized tribes could delineate TDSAs. Statistical areas defined for state-recognized tribes were identified as state designated American Indian statistical areas in Census 2000.

A change in Census 2000 policy allowed TDSAs to cross state lines, though only one, the TDSA delineated for the Pokagon Band of Potawatomi in Indiana and Michigan, did so. Another change allowed a federally recognized Alaska Native tribe that was not legally recognized as an Alaska Native Village (and therefore not qualified to be delineated an Alaska Native Village statistical area) to be delineated a TDSA for Census 2000.

State American Indian reservations and state designated American Indian statistical areas (SDAISAs). Some state governments have established reservations for American Indian tribes that are not recognized by the federal government. A governor-appointed state liaison provided the legal boundaries for state reservations to the Census Bureau in Census 2000. The Census Bureau identified each state American Indian reservation with the name submitted by the state liaison. State liaison offices also identified state-recognized American Indian tribes that did not have a legal reservation. For these tribes, state liaison offices submitted SDAISA boundaries that generally encompassed a concentration of tribal members and in which there were structured activities for tribes.

Alaska Native Regional Corporations (ANRCs)

ANRCs are corporate entities organized to conduct both the business and nonprofit affairs of Alaska Natives. The state of Alaska is divided into 12 ANRC areas, the boundaries of which the U.S. Department of the Interior established pursuant to the Alaska Native Claims Settlement Act. The Annette Islands Reserve is a separate reservation and is not included in an ANRC. As noted in the BAS and BVP sections of this chapter, the Census Bureau asked the 12 regional corporations to review the boundaries recorded for them in the TIGER® database as part of the 1999 and 2000 BAS.

Alaska Native Village Statistical Areas (ANVSAs)

These statistical entities delimit the settled portion of Alaska Native Villages (ANVs). The official list of ANVs was provided to the Census Bureau by the BIA. The Census Bureau asked each ANV to review the 1990 census ANVSA, if applicable, and delineate a boundary that would represent a meaningful depiction of its settled area. Fifteen ANVSAs recognized for the 1990 census were not identified as ANVSAs for Census 2000 because the Census Bureau learned that they were not legally established as ANVs under the Alaska Native Claims Settlement Act.

Hawaiian Home Lands (HHL)

These constituted public lands that were held in trust by the state of Hawaii for eligible Native Hawaiians; that is, people with at least one-half Hawaiian ancestry. Hawaiian Home Lands were, and continue to be, created pursuant to the Hawaiian Homes Commission Act, which the U.S. Congress passed in 1920. The federal legislation authorized the state to lease one or more tracts of land to Native Hawaiians for residential, agricultural, commercial, industrial, pastoral, and other activities identified by state law.

A Hawaiian Home Land is not a governmental unit, but rather a specific tract of state-owned land with a legally defined boundary. The 61 Home Lands covered some 205,400 acres (about 321 square miles) and varied in size from just over an acre to more than 52,000 acres (about 81 square miles).

Because data users identified a need for census information about these geographic entities, the Census Bureau agreed to recognize them for the first time in the data tabulations for Census 2000. The state's Department of Hawaiian Home Lands provided the Census Bureau with the home land names and digital maps of their boundaries.

STATISTICAL GEOGRAPHIC ENTITIES

The Statistical Areas Programs Dialogue

During the summer of 1993, the Geography Division (GEO) sought input from 1,345 data users to assist in planning the statistical geographic programs for Census 2000 and beyond. The

26-question survey drew 587 responses, or 44 percent of those contacted. The essential conclusion was that most respondents wanted the Census Bureau to maintain comparability of geographic entities with previous censuses. An additional outcome of the dialogue was support in several states for eliminating the minimum population threshold previously required for census designated places.¹⁵

Table 7-2.

Geographic Tabulation Entities for Census 2000: American Indian Area, Alaska Native Area, and Hawaiian Home Lands

Entities	Number of entities
American Indian	
Federal American Indian with a land base	315
Federal reservations without off-reservation trust land (includes four joint-use areas related to federal reservations ¹)	226
Federal reservations with off-reservation trust land	83
Federal tribes with only off-reservation trust land	6
American Indian tribal subdivisions	298
State reservations	11
Oklahoma tribal statistical areas (OTSAs) (includes four joint use areas related to OTSAs ¹)	29
Tribal designated statistical areas (TDSAs)	9
State designated American Indian statistical areas (SDAISAs)	21
Tribal census tracts ²	921
Tribal block groups ²	1,681
Alaska Native	
Alaska Native Regional Corporations (ANRCs)	12
Alaska Native village statistical areas (ANVSAs)	205
Native Hawaiian	
Hawaiian Home Lands	61

¹ A joint-use area is territory administered, claimed, and/or used by two or more American Indian tribes.

² Tribal census tracts and tribal block groups provide coverage at these geographic levels for selected American Indian reservations and off-reservation trust land, without regard to state or county boundaries. All territory included in a tribal census tract also is included in a nontribal census tract and block group; where a tribal census tract crosses a state or county line, the portion in each county represents a separate nontribal census tract. Similarly, a tribal block group that crosses a state or county line is tallied as a separate nontribal block group in each county. The two sets of numbers presented in this table one set for tribal entities and one for all entities are independent of each other and must not be added together.

Census Tracts and Block Groups

Census tracts are small, relatively permanent statistical subdivisions of a county or equivalent area that are generally delineated locally. Where local participation is not feasible, state representatives or geographic staffs in the relevant Census Bureau regional census center (RCC) delineate the census tracts.

Block groups (BGs) are statistical subdivisions of census tracts and are the smallest areas for which the decennial census tabulates sample data. BGs also are used to number census blocks within a census tract, the BG identification number being the first digit of all the census blocks defined within a BG. A census tract may contain as many as nine BGs. For Census 2000, the Census Bureau required that BGs be delineated in every county and equivalent entity in order to provide the framework for block numbering of Census 2000 data tabulation and presentation. Thus, if the BGs were not reviewed and updated locally, state officials or geographic staff in the RCCs did so.¹⁶

Census County Divisions (CCDs) and Census Designated Places (CDPs)

CCDs have been used as statistical county subdivisions since the 1950 census and are part of the Participant Statistical Areas Program (see next section). They are statistical subdivisions of counties and are delineated by the Census Bureau in cooperation with state and local government officials for data presentation purposes. CCDs were established in 21 states that lacked legally established minor civil divisions (MCDs) or in county areas that lacked governmental or administrative purposes, had ambiguous or frequently changing boundaries, or were generally unknown to the public.

¹⁵ U.S. Census Bureau, Geography Division, "Final Report—Statistical Areas Program Dialogue," December 15, 1999.

¹⁶ *Federal Register*, Vol. 63, No. 6 (January 9, 1998), pp. 1422–25.

CDPs are census reporting areas that are identifiable by name and have a marked concentration of population, but are not incorporated under state law. CDPs were reviewed and delineated for Census 2000 as part of the Participant Statistical Areas Program. In a significant change from preceding censuses, the Census Bureau did not require CDPs to meet minimum population thresholds in order to qualify for inclusion in census data tabulation. In addition, the Census Bureau determined that, unless warranted by special circumstances, CDPs should not encompass the entirety of an MCD. This change eliminated some CDPs that coincided with MCDs. Most of the CDPs thus eliminated were in the Northeast, from Pennsylvania to Maine. CDPs exist in every state and all the Island Areas except American Samoa.

The terms *zonas urbanas* and *comunidades* were used as terms for statistical place entities (equivalent to CDPs) in Puerto Rico.

Participant Statistical Areas Program (PSAP)

The Census Bureau established the PSAP for Census 2000 to ensure that some of the most important and well-known statistical entities in the TIGER® database were relevant, current, and accurate. In July and August of 1995, the agency solicited state, local, and tribal officials to participate in this program; the program covered all states, the District of Columbia, and Puerto Rico. The Island Areas also participated in the PSAP, although statistical areas in these islands were delineated during meetings between agency staff and local officials, with follow-up through transmission of computer map files and lists.

For Census 2000, the Census Bureau ceased requiring local data-user communities to establish census statistical area committees, which traditionally included government officials, representatives of other organizations, and individuals interested in this program for their specific areas. Tribal involvement in the exercise was limited to federal tribes with a reservation and/or off-reservation trust lands and the tribes in Oklahoma that were in OTSAs.

One result of this change was the elimination of what was known as the census statistical area key person. Instead, the Census Bureau used a single designated-contact agency for each area. This agency was to work with other groups, including local and tribal officials and academics among others, to conduct the necessary review and delineation of statistical entities.

The Census Bureau also worked with the state data centers (SDCs) to encourage local participation, assist local government agencies, and, in some areas, perform the delineation and/or review. If no assistance was offered, the RCCs' geographic staffs reviewed and, when necessary, revised the boundaries of the statistical entities used for the 1990 census to bring them into agreement with block boundary features used for Census 2000.

After inserting the new information into the TIGER database, the RCCs gave local officials maps and files showing the results of the process and requested their review and revision. This activity was called the verification phase of the PSAP and was not formally included in previous censuses. Participants were asked to limit their changes to boundaries that were shown incorrectly, were no longer acceptable, or required relocation to maintain relationships between statistical and legal entities. The RCCs accepted some revisions in which new statistical entities were created due to local changes that had occurred since the original delineation or had been overlooked when the original plan was developed.

Other Statistical Geographic Areas

Traffic analysis zones (TAZs). As part of the Census Transportation Planning Package, state departments of transportation, metropolitan planning organizations, and similar agencies in the United States delineated these special-purpose geographic entities for which they wanted the Census Bureau to provide transportation-related census data. The Federal Highway Administration paid the Census Bureau to provide it with TAZ data in special data files. These data were not included in the standard decennial census data files.¹⁷

¹⁷ U.S. Census Bureau, Geography Division, "Traffic Analysis Zones for Census 2000," January 12, 1998.

Urban growth areas (UGAs). In 1973, as part of an effort to control “sprawl,” the state of Oregon passed legislation requiring incorporated places to identify boundaries in surrounding territories. Responding to a 1998 request for data about these areas, the Census Bureau agreed to recognize Oregon’s “urban growth boundaries” in Census 2000. The Census Bureau referred to the resulting geographic entities as “urban growth areas.” The boundaries were delineated cooperatively by state and local officials and were confirmed by legal documentation.¹⁸

ZIP Code tabulation areas (ZCTAs). ZIP Codes were established by the U.S. Postal Service (USPS) to expedite the delivery of mail. ZCTAs are generalized area representations of USPS ZIP Code service areas. They represent the primary USPS five-digit ZIP Code found in a given area. For those areas where it is difficult to determine the prevailing five-digit ZIP Code, the higher-level three-digit ZIP Code is used in lieu of a five-digit ZCTA code. Data were published for both three- and five-digit ZCTAs.¹⁹

Metropolitan areas (MAs). Included in the general term metropolitan areas were metropolitan statistical areas (MSAs); consolidated MSAs (CMSAs); primary MSAs (PMSAs), which were subunits of CMSAs; and New England county metropolitan areas (NECMAs). Census 2000 treated the NECMAs, which represented MAs in New England defined by county rather than by county subdivision, as a standard data tabulation area for the first time. The MAs and their central cities used for Census 2000 were those in effect on April 1, 2000, as reported in an official announcement by the federal Office of Management and Budget (OMB) on June 30, 1999.²⁰ These entities were based on the official standards published in the *Federal Register* by OMB on March 30, 1990.

Urban/Rural

For the purpose of demographic analysis, the Census Bureau provided data for the urban and rural territory, population, and housing units of the nation; states and statistically equivalent entities; counties and statistically equivalent entities; and other geographic entities.²¹ In the past, the term “urban” referred only to densely settled urbanized areas (UAs) with populations of 50,000 or more or to places outside urbanized areas that had populations of at least 2,500; everything else was rural.²²

The Census Bureau decided to establish and report data for urban clusters (UCs) to improve differentiation between the urban and rural population in Census 2000. These statistical entities consisted of populations in densely settled areas containing between 2,500 and 49,999 people and included a geographic core (block groups or blocks with a population density of at least 1,000 people per square mile) and adjacent territory (primarily block groups and blocks with a population density of at least 500 people per square mile). This decision required the Census Bureau to change the urban classification for Census 2000 to include all territory, population, and housing units within both UAs and UCs as urban; together, these entities constituted urban areas. All other territory, population, and housing units were classified as rural. The Census Bureau did not automatically “grandfather” a UA from the 1990 census as a UA for Census 2000. Rather it required an area to qualify as a UA under the criteria implemented for Census 2000, or be classified as a UC.

The Census Bureau did not change the basic concept of UAs for Census 2000, but it did establish a secondary minimum population density requirement of 500 people per square mile for areas outside block groups and for those blocks constituting the urban core that had a minimum population density of 1,000 people per square mile. The Census Bureau also changed the density criterion for identifying urban territories within incorporated places. The 1990 census required a minimum of 100 people per square mile, but Census 2000 required a population density threshold of

¹⁸ Refer to <<http://www.census.gov/geo/www/tiger/glossary.html#urbanandrural>> for more information.

¹⁹ Refer to <<http://www.census.gov/geo/ZCTA/zcta.html>> for more information.

²⁰ *Federal Register*, Vol. 64, No. 125, p. 35547.

²¹ Refer to <<http://www.census.gov/geo/www/ua/ua2k.html>> for more information. For more information on demographic analysis and its applications during Census 2000, see Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

²² More specifically, an extended city for the 1990 census was an incorporated place that contained one or more land areas of at least 5 square miles with a population density under 100 people per square mile; such area(s) had to either comprise at least 25 percent of the place’s entire land area or a total land area of at least 25 square miles.

500 people per square mile for such areas. However, the criteria no longer required that incorporated places be included in their entirety if they contained only small areas of sparse settlement. This resulted in many more incorporated places being identified as extended places—partially urban and rural—than in previous censuses.

Census 2000 allowed portions of CDPs to be classified as rural. Previous censuses included or excluded the CDPs in UAs in their entirety. This enabled the census to classify CDPs as extended places. This change resulted in 254 places—172 incorporated places and 82 CDPs—whose population exceeded 2,500 failing to qualify as urban clusters because they lacked the requisite number of people living in densely settled territory. These areas were classified as rural in Census 2000. Conversely, 305 places with populations less than 2,500, rather than being classified as rural, created nuclei of urban clusters.

“Jump” criteria enable an urban area to skip over undeveloped, sparsely settled habitable land and bodies of water in order to include additional territory that qualified as urban. The Census 2000 criteria extended this from the 1.5 miles used in the 1990 census to a more meaningful distance of 2.5 miles. The requirement for a jump across a generally uninhabitable area continued to be 5 road miles. Also, the Census Bureau changed the term “uninhabitable” to “exempted” to preclude disagreements about the meaning of uninhabitable. Another refinement was the creation of the term “hop” to define separations of one-half mile or less between densely populated blocks. Previous criteria defined any separation between densely settled areas as a jump and permitted only one jump in any specific direction. The number of hops allowed was undefined.

An additional change permitted major airports adjacent to qualifying areas to be included. A major airport was defined as one used by 10,000 boarding passengers annually.

On May 1, 2002, the Census Bureau officially announced the final inventory of UAs and UCs for Census 2000 in the *Federal Register*.²³ This notice also documented UAs whose names were changed because they were deemed less widely known. Subsequently, GEO determined that a few urban clusters and urbanized areas that were very close together should not have been delineated as separate entities. The Census Bureau issued two errata notices to document these revisions to UAs and UCs in the *Federal Register* on August 23 and November 20, 2002.²⁴

Public Use Microdata Areas (PUMAs)

The Census Bureau provided specially selected extracts of raw data (public use microdata samples [PUMS]) for large-population areas in each state, the District of Columbia, and Puerto Rico.²⁵ The Census Bureau worked with the SDCs to delineate the PUMAs for Census 2000 or to coordinate their delineation by metropolitan planning organizations, local and tribal governments, and other agencies. Every SDC participated in the Census 2000 PUMA Delineation Program. PUMAs are the areas from which the PUMS samples are taken. The area included in a 1 percent PUMA, also known as “super” PUMA, must have a population of at least 400,000, and the data is a sample of 1 percent of this population. The Census Bureau provided data for super-PUMAs in a national file that was based on a 1 percent sample of questionnaires. The 5 percent PUMAs are nested within the 1 percent PUMAs and must have populations of at least 100,000.

Census Blocks

As the smallest and most numerous geographic units for which data are tabulated, census blocks are at the bottom of the geographic hierarchy.²⁶ Implementing a new strategy for Census 2000, the Census Bureau established and maintained two separate sets of block numbers—one for collection, the other for tabulation. Blocks for tabulation were renumbered to identify changes to feature patterns. (A feature pattern is a physical identifying element of blocks, such as a railroad track or culvert.) Tabulation numbers were expanded from three to four digits, and the assignment of numbers became one of the last geographic operations before tabulation processing.

²³ *Federal Register*, Vol. 67, No. 84, pp. 21962–67.

²⁴ *Federal Register*, Vol. 67, No. 164, pp. 54630–31; *Ibid.*, No. 164, p. 54631; *Ibid.*, No. 224, p. 70045–46.

²⁵ U.S. Census Bureau, “Guidelines for the Delineation of 5-Percent and 1-Percent Public-Use Microdata Areas (PUMAs),” n.d. This document is available at <<http://www.census.gov/geo/puma/puma2000.html>>.

²⁶ Refer to <<http://www.census.gov/geo/www/tiger/block.html>> for more information.

CENSUS 2000 COLLECTION GEOGRAPHY

Collection Blocks

For Census 2000, a collection block consisted of a physical block listed or enumerated as a single geographic area, regardless of any political or statistical boundaries that passed through it. For precensus and census operations, boundaries of most legal and statistical entities within these blocks, such as county subdivisions and incorporated places, were disregarded. However, a collection block could not cross the boundary of a state or county, American Indian/Alaska Native/Hawaiian Home Lands area, or military installation. In Northeastern states, block boundaries also respected municipal boundaries.

The Census Bureau's geographic staff established units to organize, control, and implement the various data collection operations. In order to increase the efficiency of the precensus and enumeration processes, the Census Bureau also established collection geography independent from the tabulation geography. Tabulation geography refers to the various geographic areas for which data are being tabulated, for example political jurisdictions such as states and cities, statistical groupings such as blocks or tracts, and administrative groupings such as police precincts or school districts. The staff considered several factors in delineating collection areas, including the estimated number of living quarters to be visited, the type of operation, the accessibility of all the territory within an area, the number of square miles in the area, and the use of boundaries based primarily on visible features.

Assignment Areas (AAs), Crew Leader Districts (CLDs), and Interim Census Tracts or Pseudo-Tracts

An AA was a geographic area established for a variety of field operations and consisting of one or more collection blocks. Crew leaders oversaw the work of field staff assigned to AAs. CLDs were delineated by the regional census center (RCC) geographic staffs by combining AAs. Interim census tracts, also referred to as pseudo-tracts, were new for Census 2000. The purpose of these tracts was to help field offices determine the location of residences of potential employees in order to assign them to areas near their homes. The tracts also identified areas that needed to be specially enumerated or visited for certain programs.

Types of Enumeration Areas (TEAs)

TEA is a classification that reflects the various operations and the method of enumeration used to collect addresses and take the census of a collection block. Enumeration methods for Census 2000 included:

- Mailout/mailback for most housing units in areas where the U.S. Postal Service (USPS) could deliver mail to specific addresses.
- Update/leave or update/enumerate in areas where the Census Bureau had to create the address list because many mailing addresses did not identify the exact location of living quarters, and therefore delivery by the USPS to the desired address could not be assured.
- List/enumerate, taken in the traditional, face-to-face-interview manner in the nation's most sparsely settled areas, on most American Indian reservations and off-reservation trust lands, and in the four major Island Areas (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the Virgin Islands of the United States).

Coding collection blocks by TEA simplified the selection of areas that were subject to particular operations like address listing, block canvassing, or a variety of enumeration methodologies from the TIGER® database.

The Census Bureau defined nine categories of TEAs:

- TEA 1: Areas where the Census Bureau performed block canvassing (a field operation to ensure the master address file contained a mailing address for every living quarter), followed by mailout/mailback enumeration.²⁷
- TEA 2: Areas where the Census Bureau performed address listing to create a geocoded address list, followed by update/leave procedures. Generally, TEA 2 covered suburban, less densely areas where mail was delivered to at least some living quarters that used non-city-style mailing addresses, such as post office or rural carrier route box numbers. During update/leave operations, enumerators left the appropriate census questionnaire a long or short form at each housing unit (HU) while updating the address list and census block maps. All of Puerto Rico was assigned to TEA 2.
- TEA 3: Sparsely settled areas of the United States (except Alaska) and Island Areas where the Census Bureau conducted a conventional list/enumerate census. Housing units in TEA 3 generally used non-city-style addresses for mail delivery. For list/enumerate, the enumerators recorded addresses, updated and map-spotted census block maps, and completed the appropriate questionnaire at each housing unit. Military bases in TEA 3 areas were enumerated by this methodology.
- TEA 4: So-called “remote areas” of Alaska where a special list/enumerate procedure was conducted. These areas generally were accessible only by small plane, boat, snowmobile, 4-wheel-drive vehicle, dog sled, or a combination thereof. The enumeration was timed to occur before the spring thaw, which might have made travel to these areas difficult. Except for timing, procedures used in TEA 4 were similar to those followed in TEA 5.
- TEA 5: Rural areas for which the Census Bureau used the update/enumerate methodology. To ensure that American Indian lands were enumerated by a single procedure, the Census Bureau also reclassified those lands with a mixture of TEA codes as TEA 5.
- TEA 6: Military installations for which the Census Bureau performed a mailout/mailback operation because the U.S. Department of Defense had advised that virtually all family-type housing had city-style mailing addresses.
- TEA 7: Urban update/leave covered collection blocks reclassified from TEA 1 for questionnaire delivery by census enumerators because experiences encountered during block canvassing led to the belief that the delivery of mail to specific apartments was “problematic.”
- TEA 8: Urban areas enumerated by the update/enumerate method.
- TEA 9: Collection blocks that were reclassified as areas for address listing with enumeration via update/leave.

IMPROVING THE TIGER® SYSTEM

The TIGER® system was the major geographic innovation of the 1990 census. In the decade leading up to Census 2000, the Census Bureau devoted considerable effort to improve its capabilities, coverage, currency, and positional accuracy.

The TIGER system provides all of the geographic products required to support taking the census, including the geographic framework for tabulating the results. It is also used to produce all of the geographic products published from the census. In addition to its value to the decennial census of population, the TIGER system provides the geographic support for all other Census Bureau censuses and surveys. Examples of the types of products generated by the TIGER system include detailed street maps used by the field staff, digital files that provide the inventory of all geographic entities needed for data tabulation systems, and maps that identify areas for which data are published.

²⁷ Block canvassing consisted of field staff providing updates to the existing address list by physically navigating each block within an AA. TEA 1 covered most housing units and represented areas that had city-style mail delivery by house number-street name.

The impact of the TIGER system in the decade of the 1990s went far beyond meeting the geographic support needs of the Census Bureau. Starting before the 1990 census, the Census Bureau released extracts of the database periodically to the public. This public version is known as the TIGER/Line® data set. Even with the limitations of the TIGER data, the public availability of a national geospatial database, free of any licensing or distribution restrictions, was a major impetus to the growth of the commercial geographic information system (GIS) industry in the United States.²⁸ Public adoption of TIGER/Line also created public pressure on the Census Bureau to release periodically improved versions of the database. Additionally, commercial GIS acceptance of the TIGER/Line format opened up new possibilities for exchanging up-to-date geospatial data between the Census Bureau and its governmental and commercial partners and provided the Census Bureau with feedback regarding the accuracy of the TIGER database.

The core of the TIGER system consists of two major elements: (1) the TIGER database of geographic features that represent the nation's roads, railroads, water features, landmarks, etc. and (2) the boundaries of legal and statistical areas and information on housing unit location—stored as either house-number address ranges or points. The original TIGER database, created for the 1990 census, reflected the features' networks and boundaries as they existed at that time. The positional accuracy requirements for the features in the database, and therefore the products produced from it, increased significantly from the needs of the 1990 census, reflecting the changes that had occurred continuously since then.²⁹ To meet the needs of the changed environment the TIGER database would face in 2000, the Census Bureau set out on an exploratory program of research, testing, and updating described below.

Assessing the potential usefulness of new geospatial technologies, such as the global positioning system and considering new “business practices,” such as increased operational collaboration between partners in the governmental and private sectors, were early goals of the exploratory program.

Cooperative research and development agreements (CRADAs)³⁰ were accords between the Census Bureau and one or more private companies to pursue common research or development interests. CRADAs were among the business practices the Census Bureau pursued. CRADAs involved no funds transfer and had been used by a number of other government agencies. The Geography Division (GEO) participated in several CRADAs designed to improve the TIGER database and explore new approaches to data dissemination.

Evaluating the Use of Global Positioning System (GPS) Technology

The Lutherville Pilot Project. In mid-1990, the Census Bureau informally agreed to work with the U.S. Geological Survey (USGS) and U.S. Postal Service (USPS) to test ways of improving the accuracy of the geographic coordinates while updating the feature network and attributes in the TIGER® database. The goal was to upgrade the geographic records of the Census Bureau and the USPS—two agencies with a great interest in having complete, accurate address files and information about the road network—thereby resulting in a common geographic database.

The anticipated end result of this effort was the creation of a geographic database that included (1) an updated feature network, with more accurate coordinates obtained by GPS technology and (2) an update of the address ranges for roads on which structures used city-style addresses (those addresses that consisted of a house number and road name for postal delivery). Participating agencies also hoped to demonstrate how combining staff expertise could benefit both agencies. Proposed sources of information included not only documented information from the USPS and

²⁸ D.F. Cooke, “Topology and TIGER: The Census Bureau's Contribution,” *The History of Geographic Information Systems: Perspectives from the Pioneers*, (Upper Saddle River, NJ: Prentice Hall, 1998), pp. 47–57.

²⁹ U.S. Census Bureau, Kristen O'Grady and Leslie Godwin, “The Positional Accuracy of MAF/TIGER,” unpublished. ACSM Annual Conference, March 2000, <<http://www.census.gov/geo/nod/positionalaccuracy.pdf>>.

³⁰ See Census Bureau press release announcing public/private partnership, “Census Bureau, Geographic Data Technology Launch New Geographic Data Initiative,” November 18, 1996; the Cooperative Research and Development Agreement, November 13, 1996; and the first statement of work, “Spatial Data Acquisition and Exchange Program.”

GEO, but anecdotal knowledge from individual letter carriers. The Census Bureau and the USPS chose the delivery area of the Lutherville, MD, post office (ZIP Code 21093) for the pilot project because it was conveniently located for both agencies' headquarters staff, and it contained both urban and rural areas.

From September 24 to 27, 1990, crews with personnel from the Census Bureau, USPS, USGS—which provided database design support and assistance with GPS-related activities—and two contractors (Trimble Navigation and GeoResearch, Inc.) drove every street and road in the test area, updating the road network information and recording about 80,000 coordinate values that identified the endpoints and shapes of the roads in the database. The accuracy of the coordinate values obtained this way was checked against 20 selected points in the delivery area that were professionally surveyed by USGS staff. The test showed that it was technically possible to obtain 50 percent of the coordinates to within 5 meters of their actual location and to rely upon a mathematical process to assign acceptable values to all other locations. Subsequent adjustment of the coordinates in the TIGER database greatly improved the accuracy and representation of map features in the area of study.

Census Bureau staff carried out additional fieldwork and database updates in 1991. Completed in spring 1992, the Lutherville project showed that GPS technology could be used to improve map accuracy, but at a great cost in staff time and money. Through the project the Census Bureau also gained knowledge about using USPS information sources to help build and maintain its address file, before the agency gained access to the USPS's delivery sequence files (DSFs) (see Chapter 8, "Addresses and Questionnaire Printing and Mailing"). In addition, the test identified problems in field operations and provided suggestions for improvement.

The Hampshire and Newberry Counties tests. Building on experience gained in the Lutherville project, the Census Bureau intended the Hampshire County, WV, and Newberry County, SC, tests to educate personnel in improving the spatial accuracy of the TIGER® database with data captured using GPS technology. In addition, the test would investigate the viability of collecting the locations (latitude and longitude coordinates) of housing units and other structures for insertion in the TIGER database. The Hampshire County test was completed in December 1997 and Newberry County in June 1998. The Census Bureau benefitted from the expertise of several private geospatial companies that participated in these two tests through the CRADA process.

Technical difficulties having to do with an inability to maintain contact with the GPS satellites invalidated the Hampshire County data, as did procedural errors. This created the need for additional testing to obtain the required information and led to the Newberry County test.

The Census Bureau chose Newberry County, SC, as the replacement test site for a number of factors:

- The location was sufficiently different in character from the Hampshire County site.
- The size was such that it could be covered within a 2-week time frame.
- The county was relatively close to headquarters, which reduced travel costs.
- The county had digital orthophoto quadrangles (DOQ)—aerial photographs corrected to remove spatial distortions in the image—that were taken since 1990.³¹
- The county was selected as a Census 2000 Dress Rehearsal venue.

The Lutherville and Newberry tests provided Census Bureau staff with valuable practical experience conducting field operations for GPS data collection. Analysts placed 3,723 anchor points in the Newberry County test. They showed that DOQs were an efficient medium for use in data collection. However using GPS with DOQs revealed a need for software improvements, image enhancement tools, and improved analyst interpretive skills.

³¹ DOQs provided a necessary independent and spatially accurate source against which the captured GPS coordinates could be checked.

GPS TIGER® accuracy analysis tools (GTAAT) evaluation. The spatial accuracy of the features in the TIGER® database varies widely depending on the source of the information from which the features are derived. In many cases, information about the accuracy of a specific source is not available. Where such information is available, errors committed in capturing it or inserting it into TIGER may result in the information not being reflected accurately in the database. This presents problems both for users of geospatial products and for the Census Bureau's efforts to improve the accuracy of the TIGER database.

In many cases, the Census Bureau consults a number of sources to get all the information for a feature in an area—for example, the position of the feature from one map, the feature name from another source, and address information from a third source. This means that the individual features may have come from sources with different levels of accuracy. Thus, maps created from the TIGER database cannot claim that all of the features have the same level of accuracy. The TIGER database accuracy is improved through Census Bureau acquisition of more accurate sources of information. As part of the effort to obtain such information, the agency must be able to evaluate the accuracy of each feature in the current TIGER database as well as all potential sources of new information to be used for updating.

To this end, the Census Bureau's Geography Division (GEO) contracted with a private company (HTE-UCS, Inc.) to develop the GTAAT to evaluate the spatial accuracy of geospatial data sets. From November 1999 through February 2000, the Census Bureau conducted a series of tests to evaluate the GTAAT. It conducted single tests in a county or parish in each of these states: Arizona, California, Florida, Louisiana, Nevada, Ohio, Pennsylvania, and Vermont. Criteria for selecting the sites were the availability of digital spatial files, updates from a variety of Census Bureau operations (Master Address File Geocoding Office Resolution, Local Update of Census Addresses, etc.), convenient transportation access, and varied terrain (to evaluate GPS signal reception).

The first test was conducted in November 1999 in Windham County, VT. This site was chosen to field test the software and procedures prior to visiting the remaining seven sites. Experiences gained from earlier GPS tests improved the effectiveness of the Vermont test with increased reliability of GPS-related equipment (losing contact with a satellite was far less of a problem); more compact and easier-to-use equipment; more user-friendly; software and vehicles more suited to the terrain. Furthermore, the Vermont test showed the value of precise, well-written procedures, in contrast to many procedures for earlier tests, which were poorly documented and required that changes be made in response to problems as they were encountered. The Vermont test was the only one of this series that covered an entire county. The other tests were conducted in selected 1990 census tracts (statistically defined subdivisions) within a single county or parish.

The tests collected highly accurate coordinates using GPS technology as well as field identification for feature points in the TIGER database. Frequently, the feature points were road intersections and were referred to generically as "anchor points." The anchor points were considered to be the true positions of these feature points for this test. After establishing the anchor points, the team performed statistical analysis on the differences between the TIGER database coordinates and the anchor point coordinates.

The team also analyzed the source and spatial accuracy of TIGER database features and, as a rule, found significant variations in accuracy depending upon the source. Sources consulted can be put into three categories: pre-1990 census, post-1990 digital exchange, and other pre-2000 update operations. The first two categories were the more spatially accurate of the three, because the potential data sources involved received far more thorough review for accuracy and more rigorous capture procedures. The updates added in many of the pre-2000 operations (described below) were hand-drawn or captured using less precise digitizing methods. The field staff collecting the data were not highly trained in mapmaking, and succeeding update operations compounded the errors committed as a result of earlier imperfections.

The Vermont project provided the first detailed, quantifiable measures of spatial accuracy for the features in the TIGER database. It also strongly reinforced the need to bring the information in the TIGER database up to a uniformly high degree of spatial accuracy.

Impact of the tests of new technology. The GTAAT tests proved the effectiveness of using GPS technology and DOQs to collect highly accurate locations of roads and living quarters. Unfortunately, the information could not be transferred readily to the existing TIGER® database. Uncertain accuracy of individual features in the existing TIGER database was a primary reason for this failing. The problem could not be solved simply by adding the more accurate features directly to the existing database because this could disrupt the features' positional relationships to each other. For example, a new feature could appear on the wrong side of an existing feature because the existing feature's coordinates were inaccurate. It was also difficult to determine if a new feature actually existed in the TIGER database but in an inaccurate location. In such cases adding the new feature created a duplicate in the database.

Although a limited number of updates were added to the TIGER database as a result of these tests, widespread adoption of these technologies would require substantial changes to existing hardware and software and operational procedures. The Census Bureau decided that it lacked the time to make the necessary changes and apply the results from the application of GPS or DOQ technology to the TIGER database. Therefore, it decided to delay large-scale implementation of these approaches until after Census 2000, when they could be included as part of a planned, large-scale initiative to improve overall TIGER accuracy.

Programs to Update the TIGER® Database Prior to 2000

The Census Bureau has been updating the TIGER® database by adding new features (roads, boundaries, etc.) and deleting those that no longer exist on an ongoing basis ever since the TIGER system's creation. The level of effort at any given time has varied due to operational needs and funding. Included below are descriptions of the principal update and improvement efforts that have involved both internal Census Bureau staff activities as well as those done in conjunction with outside organizations.

GEO, the Field Division (through its regional staff), and the Census Bureau's National Processing Center (NPC) are partners in the TIGER update effort. GEO directs and coordinates the efforts of the other divisions. It has also developed the Geographic Update System for X Windows (GusX), which is computer software that allows decentralized and interactive viewing, updating, correcting, and analyzing of the information in the TIGER database.

Update activities resulting from 1990 census operations. At times during the 1990 census, field staff were required to update and correct their maps and address lists based on what they observed. These updates did not always make it into the TIGER® database in time to be among the products based on the 1990 field operations. Beginning in 1991, the regional census centers (RCCs) updated and corrected map features with information obtained from the list/enumerate, the Post-Census Local Review, and the count question resolution operations.

Field operations to update the TIGER® database. The Census Bureau undertook a number of programs intended to improve the information in the TIGER® database. These programs are examined in other chapters, but it is worth noting here that all had a major impact on the geographic content of the TIGER database: boundaries, base features and names, and the related address ranges. The Census Bureau maintained address information in two separate databases—TIGER and the master address file (MAF)—for all operations related to Census 2000. For a variety of reasons (see Chapter 8, “Addresses and Questionnaire Printing and Mailing”), the information in the two databases was not always consistent. The address updating operations described below provided information primarily for the TIGER database.

Many of these operations involved attempts to identify and obtain useful reference materials from local governmental and commercial sources. To this end, the Census Bureau entered into a CRADA with Geographic Data Technology, Inc. (GDT) on November 13, 1996, to combine previously separate efforts.³² The joint effort sought to determine the most effective means for the Census Bureau to develop working partnerships with local governments.

³²Census Bureau press release, “Geographic Data Technology Launch New Geographic Data Initiative,” November 18, 1996; the Cooperative Research and Development Agreement, November 13, 1996; and the first statement of work, “Spatial Data Acquisition and Exchange Program.”

Improving consistency between the address control file (ACF) and the TIGER® database. At first glance, information in the ACF, which the Census Bureau used to take the 1990 census, appears similar to that contained in the TIGER® database. But address information updates obtained during 1990 census operations were not always applied to both databases equally. In 1993 and 1994 the Census Bureau performed two matches and merges between the ACF and the TIGER database in an effort to remove inconsistencies.

Feature and Reference Source Assessment Survey (FARSAS). The goal of this survey was to identify usable government and nongovernment reference sources that could help the Census Bureau locate city-style mailing addresses that it could not geocode. Earlier attempts to match such addresses to the TIGER® database failed if road names and/or address ranges were not known to the Census Bureau or had been recorded in a way the database could not recognize. Information included in sources obtained by the FARSAS enabled the agency to record street-name and address-range information that improved the database. When this information was entered into the TIGER database, the Census Bureau could match the city-style addresses in its address file to the address ranges in the database, meaning that the addresses could be geocoded. Based on the information gleaned from the 1993 Address System Information Survey (see Chapter 8, “Addresses and Questionnaire Printing and Mailing”) and earlier surveys, the regional office (RO) staff began in late 1994 to telephone each agency that reported that all or part of the area(s) it served had, or was converting to, city-style mailing addresses. The survey continued well into 1995.

TIGER® Improvement Program (TIP). In late 1994, the Census Bureau launched an operation to have planning organizations and local, metropolitan, and tribal governments in areas with city-style mailing addresses locate clusters of addresses that could not be geocoded in the TIGER® database. The assumption was that officials in these jurisdictions would know their areas better than the Census Bureau and would know the names of new roads or revised existing roads and could better locate addresses. The purpose of this 1994 operation was to reduce the Census Bureau workload in terms of the TIGER Improvement Program, which would begin the following year. All governmental units (GUs) were offered the opportunity to participate in the TIP. The Census Bureau especially encouraged participation by jurisdictions in which a substantial number of city-style mailing addresses remained uncoded after the 1994 match of the U.S. Postal Service’s delivery sequence file (DSF) addresses to the TIGER database.

Beginning in April 1995, the ROs printed lists of clusters of addresses in participating GUs that could not be geocoded. The ROs also provided these GUs with instructions and detailed TIGER system-derived maps showing the city-style address range recorded in the database for each side of a street segment.

TIP participants were asked to update the Census Bureau records by annotating the maps and lists based on records in their offices and were encouraged to carry out field checks. The geographic staff in the ROs, and later in the RCCs, inserted the updates and corrections into the TIGER database and flagged incorrect information in the address file. As a result, the computer could geocode many previously unmatched addresses.

The program wound down in 1997, but a few agencies offered to perform a second review, and the Census Bureau received the last TIP materials in September 1998. A total of 4,985 GUs agreed to participate in the program, but only 2,190 (44 percent) returned materials to the Census Bureau by the original cutoff date of mid-April 1998. After the information had been inserted into the TIGER database, each participating GU was sent a courtesy copy of updated maps covering its jurisdiction.

Master Address File Geocoding Office Resolution (MAFGOR). The ROs undertook the MAFGOR operation in an effort to geocode the city-style mailing addresses that the Census Bureau obtained from the USPS, but the effort was hobbled by the inability to match the USPS addresses to records in the TIGER® database. (A few areas were assigned to GEO and the National Processing Center for resolution). The Census Bureau hoped that MAFGOR could, for ROs and RCCs in areas that were not participating in the TIP and lacked a computerized geographic database of addresses (see AMAFGOR, below), assist geographic staff in finding each street and address range. These “missing” streets and addresses appeared in lists as clusters of uncoded addresses.

To carry out MAFGOR, the ROs went to great lengths to obtain copies of new address reference materials and to identify sources that might have additional information. RO staff reviewed diverse information obtained from various sources, such as governmental and commercial maps, atlases, address registers, postal directories, etc., for other operations. The staff supplemented this by asking knowledgeable agencies and organizations for additional information and clarification. GEO provided the RCC geographic staff with guidelines on the recommended quality of the materials, but the final decision of what sources to use was left to the RCC staff.

Using the address reference materials in combination with the cluster lists (addresses grouped by ZIP Code) and a map image from the TIGER database of the area on a computer screen, staff attempted to provide address information for each cluster by inserting updates and corrections into the TIGER database or by flagging errors they identified on the cluster lists. Resolved clusters enabled GEO to geocode the related addresses because the computer could match them to the new information in the database.

The Census Bureau began preparatory work for MAFGOR in 1993 and tested it throughout 1994. It was used in preparation for the 1995 test censuses planned for New Haven, CT; Oakland, CA; and Paterson, NJ. By February 1995, MAFGOR was underway in all ROs. MAFGOR continued in all RCCs following the delivery and processing of each new address file from the USPS. After ROs had established the “blue line,” the area for which a mailout census was planned, MAFGOR was limited to areas within that boundary. MAFGOR was put on hold during the block canvassing operation, when census employees checked the addresses for all blocks within the blue line. Beginning in November 1999, the Census Bureau implemented a major MAFGOR effort following receipt and processing of the September 1999 DSF. The effort was continued until late May 2000 following the processing of each new file from the USPS. The RCCs carried out MAFGOR for more than 1,080,000 clusters in 2,123 counties. Because the Census Bureau wanted to use this operation to try to match addresses received after Census 2000, MAFGOR continued beyond May, even though most resolutions after that time were too late to be used for Census 2000. Because the agency continued to receive addresses that did not match the TIGER database, MAFGOR continued beyond operations that supported Census 2000 operations.

Automated Master Address File Geocoding Office Resolution (AMAFGOR). Many jurisdictions in the country had developed their own geospatial digital files (computerized map files that contained street features and their attributes) to assist them in carrying out their various governmental functions. The Census Bureau identified this as another information source that could help update current street and address information in the TIGER® database.

The process of capturing information from these sources was called Automated Master Address File Geocoding Office Resolution (AMAFGOR). In simplest terms, AMAFGOR called for matching and transferring features and their attributes from non-Census Bureau data sets, known generically as digital exchange (DEX) files, to the TIGER database. Some AMAFGOR files were developed using versions of the TIGER/Line® files and may have included TIGER/Line identification codes (a nationally unique identification code assigned to each line segment in the TIGER database) as well as Census Bureau classification codes for the various types of street features. Having these data elements in common with TIGER simplified extracting AMAFGOR file information for use in the TIGER database.

GEO began exploratory discussions and testing of these files early in 1991. Once the operation was made feasible, GEO sought to test it by using a local file to update the TIGER database to ensure its maps were as current as possible. For a variety of reasons, the Census Bureau could not find a suitable local file to test. Therefore it began production with DEX files in spring 1996 without having conducted a test run.

Headquarters and RO staff identified government agencies that had the desired files via the FARSAS, MAFGOR, and other operations that had put the Census Bureau in contact with knowledgeable officials. The procurement of commercial files for areas lacking good reference sources

was conducted using the U.S. Department of Commerce's Concept of Operations (CONOPS) acquisition process.³³ Through CONOPS, the Census Bureau awarded a contract in September 1997 to purchase such files from one source, Geographic Data Technology, Inc. (GDT). The contract with GDT ensured that DEX files would meet agency requirements in terms of compatibility with the TIGER database. GEO staff evaluated each potential file from the vendor for feature accuracy and completeness in comparison to existing TIGER data for that area. The Census Bureau purchased only those files that surpassed the TIGER data. Compatibility enabled the Census Bureau to use a file immediately to perform efficient automated matches of the file's information against the master address file (MAF).

If a DEX file for an area matched more address ranges than the information in the TIGER database, the Census Bureau used that DEX file to merge the missing street and address information into the TIGER database. Upon completing the merge, GEO verified the quality of the updated information in the database and the ROs or RCCs interactively cleaned up residual errors. These steps constituted some or all of the AMAFGOR process, which was intended to improve the information in the TIGER database while requiring less manual intervention than needed in conventional methods and to help the Census Bureau geocode many of the city-style addresses in the MAF for the areas covered by DEX files.

If addresses remained that the database could not geocode, verifying their locations and information became part of the MAFGOR operation. Like MAFGOR, AMAFGOR was an ongoing process to support the continuing need to update the TIGER database and the MAF—not only for Census 2000, but for subsequent censuses and surveys.

As part of the CRADA, GEO and GDT agreed to attempt to develop an efficient DEX system that would enable both to share geographic files received from local governments. After initial analysis, GEO determined that it could not divert the resources from Census 2000 preparations that were needed to continue with the additional DEX system development. The Census Bureau planned to resume the program when sufficient resources were available.

Targeted map update (TMU). Because the ROs and RCCs could not find the needed information for all uncoded city-style mailing addresses in the office via the MAFGOR operation, the Census Bureau created TMU, a field operation to resolve this problem. TMU was limited to areas within the blue line (the area for which a mailout census was planned) because address listing operations that were already setup could handle this task for areas outside the blue line. As with MAFGOR, the goal was to update information in the TIGER® database without altering individual addresses in the MAF.

The first attempt made by the Field Division to resolve problems stemming from the uncoded addresses involved trying to obtain information from local sources identified by the RCCs as having information that could be found only at that source. This might be a government agency a tax assessor's office, the police or fire department, etc. whose records were in a form not easily copied for use in MAFGOR. In order to reduce intrusiveness and possible duplication of effort, (since some agencies and organizations were contacted during prior Census Bureau operations), each RCC specified that enumerators must receive clearance before visiting any of these places. The staff also was instructed to get assistance resolving uncoded addresses from post offices (as identified by ZIP Code) serving the area.

If problems remained, the staff was directed to:

- Try to find the streets and address ranges in the field.
- Determine the proper geographic code for the addresses.
- Use the maps to add and correct streets and address ranges.

RCCs attempted to resolve every uncoded address on the list, and they used the materials gathered both to update the TIGER database and to flag erroneous records in the MAF. The information enabled the staff to match, and therefore geocode, most of the problem addresses.

³³ The Census Bureau changed this terminology to "A Streamlined Acquisition Process" (ASAP) in 1998.

Before conducting the actual TMU operations, staff from headquarters, the National Processing Center (NPC), and the Charlotte RCC visited Shelby County, KY; Chatham County, NC; and Union County, SC, in September and October 1997.

From September 1998 to January 1999, the Census Bureau performed TMU in 6 counties in the Atlanta region, 43 in the Charlotte region, and 29 in the Philadelphia region. The goal was to obtain accurate map and address information of the mailout/mailback area by the time block canvassing began in early 1999. Work in some counties was completed too late for the information to be processed into the TIGER database in time to be used for Census 2000 block canvassing.

The Census Bureau continued to perform TMU as needed to attempt to geocode residual address problems that MAFGOR could not resolve. Local census office participation included an effort covering about 1,300 counties that began in early October 1999 and continued through January 2000. The RCC attempts to resolve address problems via TMU continued from early March through early May 2000. The effort extended to many of the same counties visited for earlier TMU efforts.

These field reviews included addresses that the computer could not geocode from the late-delivery DSFs and other late address operations (see below). TMU continued in a few areas beyond early May, but those resolutions generally were too late for use in Census 2000. For these phases of TMU, the Field Division dealt with almost 45,000 clusters (address groupings with the same street name, ZIP Code, and hundred-range house numbers) in some 1,800 counties.

Census map preview (CMP). From late 1996 through 1997, the CMP program provided relevant maps that showed the streets recorded at that point in the TIGER® database. These maps were provided to every GU that was not offered the opportunity to update this information by the TIP, Tribal Review Program, or the 1997 Boundary and Annexation Survey. The Census Bureau asked local government officials to update the maps to show missing or misnamed streets, delete nonexistent streets, and correct or add city-style address ranges for any street segment.

Except for unnamed streets, highlighted in purple, the maps were like those the Census Bureau provided to GUs for the 1997 BAS. The GUs annotated the maps and returned them to the ROs, where the maps were used to update the TIGER database.

The scheduled CMP completion date was August 1997, but maps continued to trickle in well into 1998, as GUs completed their reviews. Of the 27,467 GUs the Census Bureau contacted, 10,150 (37 percent) responded.

Address Listing Map Review (ALMR). ALMR helped the Census Bureau toward its goal that roads and streets shown on the maps listers would use for the 1998 address listing operation be as accurate, complete, and current as possible. To accomplish this, ALMR encouraged local and tribal officials of GUs located outside, or split by, the blue line to identify incorrect and missing streets and street names on the Census Bureau maps provided to them. The GUs included in this effort contained areas outside the initial mailout/mailback area and consisted primarily of outlying areas where the USPS did not deliver mail to house-number and street-name addresses.

The Census Bureau requested that GU officials return information about city-style mailing address ranges existing in their jurisdictions. The Census Bureau also asked the officials to identify the city-style addresses at points where a road intersected the GU's legal boundary. This would enable the Census Bureau to update the TIGER® database in time for the address listing of the GUs. The Census Bureau placed special emphasis on obtaining cooperation from GUs that had not responded to, or participated in, previous attempts to acquire this type of information.

Beginning early in January 1998, the ROs and RCCs sent letters to officials of the 30,200 eligible local and tribal governments, requesting them to annotate and return a copy of a Census Bureau map of their areas. Of the more than 8,000 GUs that expressed interest in the ALMR, a total of 7,564 participated in the program. The Census Bureau asked participating officials to use the maps from the 1998 BAS for this purpose or, if appropriate, the Census Bureau provided them with special maps derived from the TIGER database.

ALMR began in late January and continued into February of 1998. The Census Bureau asked local and tribal officials if any nonparticipating GUs had undergone changes to the street network or address system since the most recent update and requested them to provide a current street map or digital map file for the GU or to identify sources that might have the desired information.

The Census Bureau planned to complete ALMR by the beginning of April, but received the last update eligible for inclusion in the TIGER database in time for use in the census address listing operation on May 5, 1998. The agency continued to update the database as new information arrived from participating GUs through the remainder of the year. Of the 8,024 GUs that offered to participate or were interested in participating, 6,327 GUs (79 percent) actually worked with the Census Bureau to return annotated maps, provided other information, or reported that the agency's maps were accurate.

Geocoding Accuracy Assessment (GAA). The Census Bureau intended the small-sample GAA survey, conducted February through March of 1998, to assess the accuracy of address ranges in the TIGER® database.

The survey included 600 geocoded city-style addresses in 18 metropolitan areas and 6 nonmetropolitan areas. GEO provided each RO or RCC with lists of basic street addresses selected from the MAF, together with maps of the areas in which the addresses were believed to be located. RO staffs were asked to find each address in the field, enter a map spot and its preselected map spot number on the map to show the location of the address, and annotate the list to indicate that the address was found, did not exist, or could not be located. The addresses' block assignments were matched against those recorded for the addresses in the TIGER database.

In May 1998, GEO staff reconciled most of the mismatched and uncoded addresses found by RO/RCC staffs. In the end, 15,416 (95.2 percent) of the original 16,200 addresses were listed in the field and 99 percent of these could be geocoded. Of the geocoded addresses, 13,751 (90.1 percent) matched the TIGER database geocoding at the block level.

The addresses were not selected using a scientific sampling process specifically designed to provide national estimates of geocoding accuracy, so applying the results from this study on a nationwide basis was not valid. However, the study did meet its goal of providing a useful general assessment of the geocoding capabilities of the TIGER database and helped identify necessary improvements. One improvement identified was the need for better address ranges in the TIGER database. This led GEO to implement the Automated Address Range Program (see below). The study also helped GEO improve its imputation algorithm for splitting address ranges where legal boundaries obtained as part of the Boundary and Annexation Survey intersected roads with address ranges.

Automated Address Range Program (AARP). First implemented in March 1999, the AARP was a fully automated process created by the Census Bureau to achieve a consistent address-to-block number relationship between field-verified city-style addresses in the master address file and the address ranges in the TIGER® database. The AARP ran automatically during the address reconciliation phase of Census 2000 whenever newly recorded city-style addresses created new address ranges in the database. Its corrections were subject to a quality assurance review.

Using field-checked residential addresses in the MAF, the AARP expanded existing ranges to create new address ranges related to street features in the TIGER database. Implementation of AARP involved two phases:

- The initial address-range load, which entailed matching MAF addresses and the TIGER address ranges and reconciling differences.
- AARP postprocessing, which consisted of a series of improvements to address ranges and road names (including alternate identifiers).

Postprocessing converted actual ranges to potential ranges (e.g., if 121, 125, 131, and 137 were the only addresses in the 100-range on the odd-numbered side of a street, the database would show a potential range of 101–199), checked consistency of odd and even ranges along a series

of segments of the same street, standardized street names, eliminated unnecessary address ranges and anomalies, and applied ZIP Codes to new ranges. The USPS's ZIP+4 file (see Chapter 8, "Addresses and Questionnaire Printing and Mailing") provided the information needed to split address ranges based on ZIP Code.

The Census Bureau also used AARP to suppress address ranges containing a single address. Such ranges could occur where a single existing house number was the only address on one side of a street segment or the house number was out of parity or sequence with the other addresses on the same side of a street. For example, an address of 103 as the only odd-numbered address on the even-numbered side of the 100s-range of a city block would be out of parity. However, in March 2000, the Census Bureau's Disclosure Review Board, believing that address information in the TIGER database fell under the confidentiality restrictions of Title 13, U.S. Code, instructed GEO to suppress single addresses from publicly available products such as the TIGER/Line® files. This had the effect of forbidding the Census Bureau from publicly recognizing the existence of a specific single address. It could, however, release the range of potential addresses along a street that may or may not reflect the addresses actually in use on that street.

In previous censuses, most Census Bureau addresses came from public sources, thus address ranges recorded in the TIGER database were believed not to be subject to Title 13 confidentiality requirements. The TIGER database improvement operations prior to Census 2000 resulted in many addresses coming from the Census Bureau's field operations. The opinion was that this put address information in the same confidentiality status as the statistical data collected about individuals. Implementing this decision required GEO to make sure that AARP attempt to include more than one address in each of its address ranges, but this was not always possible.

Other Programs Affecting TIGER® Content

Programs the Census Bureau instituted to improve its address list and geographic information also resulted in improvements to the map features and names in the TIGER® database. These programs (which are discussed in Chapter 8, "Addresses and Questionnaire Printing and Mailing") included the Boundary and Annexation Survey, the Tribal Review Program, the Census 2000 Redistricting Data Program, the Participant Statistical Areas Program, and the Local Update of Census Addresses. Depending on the program, information derived from these operations was entered into the TIGER database by staff either in the National Processing Center or the RCCs. When all map-related revisions were included in the TIGER database, the Census Bureau could locate and link the related addresses that had been added to the MAF. In addition, GEO constantly ran edits and quality checks of the information in the database. For example, in mid-1999, the division reviewed codes that classify the types of features in the database; this review resulted in the discovery and removal of numerous irrelevant, obsolete, and rarely used codes.

Updates from Census 2000 field operations. During the 1990s, the Census Bureau conducted a variety of field operations that provided updates to the TIGER® database. Most of the updates were to very limited geographic areas. However those updates conducted immediately prior to the census resulted essentially in nationwide activities.

Special censuses. During intercensal years, the Census Bureau took censuses of local jurisdictions on a cost-reimbursable basis. Jurisdictions requesting special censuses typically had experienced considerable population growth since the previous census. An officially certified population count from the Census Bureau documenting the increase could significantly affect the amount of government funding a jurisdiction may receive.

These enumerations usually were conducted in the traditional door-to-door method. Enumerators used maps prepared by the Census Bureau to find their way around their assigned areas, noting corrections and updates to the map features and names as they went. The Data Preparation Division's National Processing Center entered this information into the TIGER® database. However, the Census Bureau did not use the information gathered to update its address file. To avoid interference with preparations for Census 2000, the Census Bureau suspended taking special censuses after mid-1998.

Census 2000 field test program. As it had in the decade before each of the preceding four decennial censuses, the Census Bureau conducted a series of tests of methodology, content, and design to develop the optimum operational plan for conducting Census 2000. The tests also provided an opportunity for a limited amount of updates to features and addresses for the TIGER® system. The operational details of those tests and their geographic support requirements are discussed in Chapter 2, “Planning the Census.”

Census 2000 Dress Rehearsal. In 1997, the Census Bureau began conducting portions of the Census 2000 Dress Rehearsal. These processes continued through 1998, with a focus on the Dress Rehearsal Census Day of April 1, 1998. The goal was to test the operational plan for Census 2000, including all of the preliminary operations that start more than a year before the actual census. The dress rehearsal sites were Sacramento, CA; Menominee County, WI; and 11 counties (plus a small portion of a twelfth) including and in the vicinity of Columbia, SC. Street and address information added, deleted, and corrected for the various dress rehearsal operations were added to the MAF and the TIGER® database. Dress rehearsal activities are discussed in Chapter 2, “Planning the Census.”

Precensus operations. As part of the final preparations for a decennial census, the Census Bureau conducts a series of field operations. The specific operations may vary from census to census, but they begin taking place at some point before Census Day and always include the collection of updates to features and addresses. These updates are used in the geographic products supporting the census. Updates from precensus operations that contributed to the TIGER® database are discussed here. The operational details of those activities and their geographic support requirements are discussed elsewhere in this chapter.

Address listing operations began in March 1998 in areas classified by the Census Bureau as TEA 2 (type of enumeration area). These areas were outside the so-called “blue line” where city-style addresses were the rule. In all or part of 2,944 additional counties, including the 78 municipios in Puerto Rico, the Census Bureau listed addresses in three waves from July 30 through December 31, 1998. The Wisconsin and South Carolina dress rehearsal sites were not relisted for this operation.

The operation consisted of the participating field staff noting in an address register the address or location description of each potential dwelling unit, the relevant collection block number, and significant information for each living quarter. In addition, the field staff assigned a map-spot number to each residential structure, drew a map spot, entered its number at the approximate location on the census block map, and updated and corrected the block maps. The NPC keyed the addresses and their map spot numbers into a master address file update file (MAFUF) (see Chapter 8), and inserted map changes into the TIGER database. The NPC electronically scanned the address listing maps to provide map images that were the basis for digitizing the map spots; this ensured that the spots and their associated numbers were inserted as accurately as possible into the TIGER database. For maps that could not be scanned primarily separate, hand-drawn sketch maps of densely developed areas the NPC digitized the map spots and inserted their numbers, together with the added and corrected street information, into the TIGER database.

Block canvassing operations began in January 1999. Field staff checked the completeness and collection-block assignments of the addresses in mailout/mailback areas, where the USPS delivers virtually all mail to city-style addresses. For the most part, this operation was confined to areas classified as TEA 1 in all or part of 2,096 counties; it also took place in TEA 6, which applies to military bases located in TEA 2 areas. The NPC keyed the address updates and revisions into a MAFUF and inserted map changes into the TIGER database. Field staffs’ revisions to the address-to-block number relationship, which were recorded in the MAF, were used to correct the address range information in the TIGER database, thereby assuring consistency with the MAF.

The Use of Map Spots for Housing Units

In many areas—termed noncity-style mailing address areas—the addressing system does not allow for easy, unambiguous identification and comprehensive listing of individual housing units. This makes it very difficult to develop the complete list of housing unit addresses needed for a mailout/mailback census. The problem is most common to rural areas where units may be located along an unnamed road (or one with no road signage) or where they are not assigned individual house numbers (or none are displayed). Even where units are assigned post office box numbers, the units themselves may not be visibly numbered or the numbers may be assigned to an individual or household for mail pick-up at the post office.

The Census Bureau began testing and implementing the use of map spots before the 1990 census as a way of mitigating this problem. Census Bureau field staffers conducted these map spot tests, while performing address-listing operations in areas with noncity-style mailing addresses. They entered uniquely numbered map spots on the enumerator maps in the approximate location of each residential structure. This provided the Census Bureau with a surrogate housing unit identification system that enabled the creation of a complete list of housing units. That list could be used by field staff in subsequent operations.

The Census Bureau assigned each map spot within a specific numeric range in the database to the type of living situation it represented: housing, special place/group quarters, or military housing. This enabled GEO to provide maps displaying the locations of special types of living situations for the appropriate field operations.

The Census Bureau determined that having these map spots in the TIGER database so that they could be displayed on printed maps at any stage in the census operations would be useful. Operational considerations precluded this, so the Census Bureau stored this information in an auxiliary database.

The Census Bureau digitized map spot information from the 1997 address listing operation in the Columbia, SC, and Menominee County, WI, sites into the TIGER database for use in the dress rehearsals. The Census Bureau also generated maps showing the map spots and numbers for the 1998 Local Update of Census Addresses (LUCA) and update/leave operations. Census enumerators annotated additions and corrections to the map spots. This information was digitized into the database for new maps to be used in both dress rehearsal and Census 2000 operations. The Census Bureau entered map spot information from the 1998 address-listing program in other parts of the United States and all of Puerto Rico into the database so that the information would appear on maps generated for subsequent operations. In addition to address listing of areas, Census 2000 required enumerators to assign map spots and numbers in list/enumerate areas. This information was digitized into the TIGER database after the maps were sent to the NPC.

Entering Map Updates Into the TIGER® Database

As a rule, NPC staff manually inserted map corrections and additions into the TIGER® database. This operation consisted of reviewing updates on field maps and recording that information into a portion of the TIGER database shown on a computer screen. This method required a minimum of hardware (no digitizing table) and specialized software. However, it presented opportunities for degrading the spatial accuracy of the TIGER database by adding the inherent inaccuracy of the office clerks' "eyeballing" approach of transferring map information from field staffs' hand-sketched feature location to the computer screen. As noted earlier, correcting the resulting inaccuracies in the TIGER database was a goal of the GPS research activities.

Because the Census Bureau identified most residential structures outside of city-style addressing areas nationwide with map spots and numbers, a quick and accurate process for entering information gathered during address-listing operation, as well as in subsequent field activities, was essential. The NPC was central to this process. It electronically scanned annotated block maps to provide map images that were used as the basis for digitizing the map spots. Rather than having to deal with large numbers of individual block maps in various states of disrepair after their usage in the field, the NPC process let clerks view scanned maps on computer screens and digitize each map spot and its number by simultaneously touching the location of the map spot on the screen

and clicking the map spot number from a list with a mouse. This ensured that the spots and their associated numbers were incorporated as accurately as possible into the database. The clerks recorded the map-spot numbers at the same time. The results of this procedure were twofold:

- The location of each map spot was calculated automatically in reference to the coordinates of the corner points of the map shown on the screen.
- The calculation and entry into the database were performed in a batch operation as each county was completed.

The NPC digitized the map spots and inserted their numbers from the original maps, together with any updated street information, into the TIGER database. Quality control clerks reviewed the maps from all stages of the operation to ensure that the map spots appeared in the correct geographic relationship to the streets and roads in the database. To ensure that the TIGER database contained the same information as the MAF, the NPC reviewed the results of an edit that matched map-spot numbers in the MAF and the TIGER database.

Block maps also were scanned for use in two census field operations that required enumerators to record map spots: the update/leave and update/enumerate operations. The maps used in these operations displayed the many map spots and numbers obtained during address listing, so they were at a larger scale than those used in the address-listing operation. This resulted in the near doubling of the number of maps that the NPC needed to review. To minimize the need for clerks to look at all these maps, the scanning program was improved so that each scanned map appeared on the computer screen simultaneously with the same map area currently recorded in the TIGER database. By looking at the two maps overlaid on one another, clerks could identify and insert both feature changes and map-spot changes without handling the field maps. The information was again entered into the database in a batch process, with the computer automatically calculating the coordinate values of map spots and feature changes in relation to the values of each map's corner points. The results were reviewed for completeness and accuracy. A subsequent edit ensured that map-spot numbers in the MAF appeared in the TIGER database.

The Census Bureau used the term “remote Alaska” to refer to the most sparsely settled areas of Alaska as depicted on maps annotated by enumerators. The maps were digitized by GEO staff. All other digitizing and scanning operations including digitizing all information for the other list/enumerate areas were carried out in the NPC. While input from other operations was digitized into the TIGER database as the annotated maps and time became available, NPC did not scan the list/enumerate maps because it received them just as it was completing the update/leave maps and beginning work on the update/enumerate maps. Rather than overwhelm the NPC with work, GEO chose to use NPC's limited available scanning equipment to record the larger workload from the update/enumerate areas. As result of GEO's decision, map updates received from the nonresponse follow-up and coverage improvement follow-up operations were not digitized until the summer of 2001, long after the maps for Census 2000 were finalized.

Geographic Products to Support the Census 2000 Field Operations

The Census Bureau developed a wide variety of geographic products to support the Census 2000 data collection operations. Often these products were included as part of census test activities (described in Chapter 2, “Planning the Census”) carried out in the years leading up to the census. The products, which included files listing geographic entities, address lists, and maps, also were used in the many field operations related to conducting Census 2000.

Census tests. The first large-scale test was in 1995 in three areas (Oakland, CA; Paterson, NJ; and six parishes centered around Natchitoches in northwestern Louisiana). In 1996, the Census Bureau conducted a test census in seven scattered census tracts in Chicago and two American Indian entities (Acoma Pueblo, NM, including off-reservation trust lands, and Fort Hall Reservation, ID).

For these tests the Census Bureau produced several series of maps for each field operation, including recruiting, update/leave, LUCA, nonresponse follow-up, tribal review, rural address listing, and Integrated Coverage Measurement. Typically, each operation required multiple map types

and page sizes to support various facets of the work. There were five basic map types for Census 2000 field operations:

- **Entity-based map** (36 by 42 inches, color): Field office supervisors and crew leaders used these maps to determine assignments for field staff and to plan and manage the field operations. For multicounty local offices, staff could tape county maps together to form a wall map of the entire area or stack maps together in an atlas format. These maps featured:
 - Local census office (LCO) boundaries (if applicable).
 - Map grid of assignment area boundaries and numbers.
 - Location and names of major highways.
 - Location and names of major hydrography.
 - Location and names of features coincident with boundaries.
 - Boundaries and names of selected legal and statistical entities.
- **Locator map** (11 by 17 inches, black and white): Locator maps showed the location of a geographic entity within a larger area to help crew leaders and field staff identify the location and determine a route of travel to it. These maps included the following features:
 - Subject entity (which was marked by shading).
 - Roads, hydrography, railroads.
 - Names of linear features and names of geographic entities.
- **Assignment area map** (11 by 17 inches, black and white): Crew leaders and field staff used these maps to identify the boundary of each assignment area and the block to be visited or the city-style address ranges to be checked for the street segments within it. These were also used to annotate updates and corrections. The following features appeared on the map:
 - Area outside subject assignment area (which was marked by shading).
 - Roads, hydrography, railroads, and other linear and area features.
 - Boundaries and names of selected geographic entities.
 - Names of linear and area features.
- **Block map** (11 by 17 inches, black and white): Field staff used these maps to identify the boundary of the block. These maps were also used to determine a route of travel around and within a block and to annotate map spots and numbers and map updates and corrections. These maps included the following features:
 - Area outside the subject collection block (which was marked by shading).
 - Roads, hydrography, railroads, and other linear and area features.
 - Boundaries and names of selected geographic entities.
 - Names of linear and area features.
 - Map spots (selected operations).
- **Street index** (printed on the related map or a separate sheet): Field staff used street indexes to find named roads on the map. Indexes provided a list of all named roads in alphanumeric order.

The Census Bureau produced a series of geographic reference files (GRFs) that provided information about the geographic framework for the field operations. These files also were integrated into the field-map production system. In addition to GRFs' use in field operations, they were produced for data-tabulation operations. This effort is described in more detail in Chapter 6, "Data Capture and Processing."

Census 2000 Dress Rehearsal. In 1998, the Census Bureau conducted the Census 2000 Dress Rehearsal at the earlier-noted sites of Menominee County, WI; Sacramento, CA; and 11 counties (and part of a twelfth) in South Carolina. This operation tested the plans and process for taking the census.

As with earlier census test programs, the Census Bureau produced several series of maps and GRFs for dress rehearsal field operations. Each operation typically required multiple map types and page sizes (either 11 by 17 inches and 36 by 42 inches) to support various facets of the work.

Census 2000. The Census Bureau produced a variety of map products, address products (see Chapter 8, “Addresses and Questionnaire Printing and Mailing”) and GRFs to support the census field operations. The various field operations associated with Census 2000 required a large volume of maps. Beginning with recruiting and other operations in the year before Census Day and continuing through the follow-up and evaluation activities, the Census Bureau produced more than 41.7 million 11 by 17 inch map sheets. It also produced over 1 million 36 by 42 inch large-format maps. The large-format maps were produced on plotters in the regional census centers (RCCs). The 11x17 inch maps were printed on laser printers either in the RCCs or in LCOs, as appropriate.

Map Production

The following general description of the map production operation explains how most of the maps were produced for data collection and TIGER® updating.

GEO’s mapping staff relied on extensive customer consultation to develop the map content, design, and scale to meet the required specifications. As part of this process, staff developed a production system that combined map design parameters, the appropriate extract from the TIGER database, a production control system, and a quality assurance review. Field offices (RCCs and LCOs) initiated and controlled production of the maps through a multistep process that produced a single Map Image Metafile (MIM)® for each map sheet.

Field office staff checked a small sample of the maps produced. Maps with problems were referred to GEO for resolution. As the field staff needed maps for specific operations, they printed the requested map from the MIM using custom-designed map printing software. The maps were designed to print to sizes of 11 by 17 inches or 36 by 42 inches depending on their purpose. The smaller maps were printed on laser printers, while the larger maps were printed on large-format plotters.

The MIM concept resulted from the Census Bureau’s experiences after the 1990 census. Maps for that census were printed using commercial plotters and from files stored in a proprietary format readable only by specific plotters from a particular manufacturer. This approach was also used for the reproduction of public map products of census tracts and blocks. The manufacturer discontinued the map-making equipment during the 1990s and went out of business a short time later. The existing maintenance contract lapsed. This left the Census Bureau no easy way to reproduce maps that met customer requests.

Switching to MIM files offered a clean solution. The MIM file was simply a detailed description of a map in ASCII format. Since the format is well documented, it is a fairly straightforward task to write a plotting utility that works best when new hardware becomes available. This meant that MIMs and the maps they represent were relatively immune from problems posed by technological change.

Chapter 8.**Addresses and Questionnaire Printing and Mailing**

IMPROVING THE ADDRESS FILE	351
Introduction	351
Origin of the Census 2000 Address File	351
1990 census address control file	352
Delivery sequence file	352
ZIP+4 file	354
Special Places/Group Quarters	355
Blue Line Delineation	356
Filling the Gaps in the Address File	357
Address System Information Survey (ASIS)	357
Rural Addressing Program (RAP)	358
Program for Address List Supplementation (PALS)	358
Addresses From Precensus Operations	359
Test censuses	359
Dress rehearsal	359
Address listing	359
Block canvassing	360
Post-Block Canvassing TIGER® Update (PBCTU)	361
American Community Survey (ACS)	361
Local Update of Census Addresses (LUCA)	362
LUCA 1998	363
LUCA 1999	364
LUCA training	365
Participation in LUCA 1998 and LUCA 1999	365
Supplemental LUCA	366
The LUCA operation	367
The LUCA appeals process	369
Survey of participation in LUCA	370
LUCA special place program	370
New Construction program	371
Confirmation of destruction of Title 13 materials	373
Administrative records	375
Postal validation check (PVC)	375
CRADA to improve the address list	376
Master Address File Quality Improvement Program (MAF QIP)	376
ADDRESSES FROM CENSUS 2000 FIELD OPERATIONS	377
Update/Leave (U/L) and Update/Enumerate (U/E)	377
Urban Update/Leave (UU/L)	378
List/Enumerate (L/E)	379
Redelivery of Undeliverable Questionnaires (UAA Redistribution Operation)	379
P.O. Box-Only Addresses in TEA 1	380
Nonresponse Follow-Up (NRFU)	381
Residual NRFU (R-NRFU)	381
Field Follow-Up (FFU)	382
Coverage Improvement Follow-Up (CIFU)	382
Be Counted and Telephone Questionnaire Assistance (TQA)	383
Household and Address Field Verification (HA FV), or Invalid Return Detection (IRD)	384
Questionnaires Without a MAF Identification	384
Elimination of Duplicate Housing Units	386
Addresses Changed During Enumeration	386
Accuracy and Coverage Evaluation (A.C.E.)	387

CONTENTS

QUESTIONNAIRE PRINTING AND MAILING	387
Questionnaire Design and Development	387
Printing Contracts	390
Quality Assurance for Printing Operations	391
Pre-award QA	392
Prior-to-production QA	392
Production QA	392
Printing error in the advance letter	393
Mailing Piece Addressing and Delivery	394
Advance letter	395
Questionnaires	395
Reminder card	396

Chapter 8: Addresses and Questionnaire Printing and Mailing

IMPROVING THE ADDRESS FILE

Introduction

In November 1990, the Census Bureau established a committee to develop recommendations on how to improve Census 2000 over the 1990 census, in ways that would also control costs. One of the critical considerations was a redesigned mailing list. Because the address list would serve as the basic control for the census, one of the agency's goals to ensure that Census 2000 would be more accurate and complete while being more cost-efficient was to improve the development and content of its address file.¹ To this end, the Census Bureau established a goal of re-using city-style mailing addresses from the 1990 census and developing partnerships with the U.S. Postal Service (USPS) and knowledgeable state, regional, local, and tribal governments.² Accordingly, in November 1990, the Census Bureau and the USPS established an interagency Joint Committee for Census Planning to undertake cooperative efforts for enumerating much of Census 2000 by mail.³ The Census Bureau also sought to determine the availability of address lists and address-range information from local governments. This would obviate the need for the Census Bureau and the USPS to undertake many of the operations used during the development of the address list for each of the previous three censuses. The Census Bureau also wanted to be able to incorporate non-city-style addresses into its automated address operations and to integrate all its censuses with the agency's automated geographic system, the Topologically Integrated Geographic Encoding and Referencing system (TIGER®) database.

Origin of the Census 2000 Address File

The Census Bureau estimated that it would have to manage about 119 million residential addresses for Census 2000, including Puerto Rico (1.4 million) and the four major Island Areas (114,000). In 1998, the Geography Division (GEO) created a master address file (MAF) as the repository for every residential mailing address, physical/location description, etc., that it could obtain.⁴ GEO had already prepared a limited MAF in 1995 for use in the areas covered by a Census 2000 test census and in 1997 to support the dress rehearsal and the beginnings of the American Community Survey.⁵ This file contained both residential and nonresidential addresses. The MAF was the basis for the decennial master address file (DMAF), which was limited to residential addresses that could be linked successfully to the TIGER® database. The DMAF served as the control file for taking the census and tabulating the data.⁶

¹ See, U.S. Census Bureau, "The Reengineered 2000 Census," May 19, 1995; and Chapter 2, "Planning the Census," especially the section entitled, "Task Force for Designing Census 2000."

² City-style mailing addresses were those to which mail was delivered based on the structure's house number and street or road name.

³ See, "Agreement Between the United States Bureau of the Census and the United States Postal Service," signed by Anthony M. Frank for the USPS on November 20, 1990, and by Barbara Everitt Bryant for the Census Bureau on November 21, 1990.

⁴ See, U.S. Census Bureau, "Census 2000 Address Listing Operation," Information Memorandum No. 80, November 7, 2000; cover memorandum dated November 14, 2000.

⁵ See Chapter 2, "Planning the Census," for details.

⁶ U.S. Census Bureau, "The Decennial Master Address File (DMAF)," Information Memorandum No. 51, June 20, 2000, cover memorandum dated June 26, 2000.

The initial MAF was a product of the merger of three files:

- All city-style mailing addresses recorded in the 1990 census address control file.
- The USPS's delivery sequence file.
- The USPS's ZIP+4 file.⁷

1990 census address control file. Following the 1990 census, the Census Bureau retained a substantial number of the addresses that it had recorded and that the GEO coded for the census. The agency also integrated the addresses from its 1990 census file of special places and group quarters into the address control file (ACF). However, these addresses were not carried to the MAF because the Census Bureau decided to start fresh with the Census 2000 inventory of these facilities. GEO performed extensive programming from 1993 to 1997 to develop the file structure of the MAF and to improve the TIGER database to facilitate an effective matching and merging of the information in the ACF, the other address files described below, and the TIGER database. The Census Bureau has estimated that almost 71.4 million addresses—61.6 percent of the total addresses in the final Census 2000 housing inventory—were provided from the ACF without subsequent action needed.⁸

Delivery sequence file. In 1993, the USPS introduced a delivery sequence file (DSF), a nationwide database of the residential and nonresidential addresses served by the USPS. The May 1994 DSF contained more than 137 million addresses; of the 120 million residential addresses in that file, about 99.3 million were city-style, including 22 million multiunit addresses (apartments in an apartment house, mobile homes in a trailer court, etc.). The initial address coverage used by the Census Bureau for the previous three decennial censuses had been limited to what was available from commercial vendors for the urban cores of metropolitan areas. The DSF consisted of numerous data tapes, and the sheer volume required considerable computer-processing time; e.g., for the November 1999 DSF, GEO needed 2 days to process 32 tapes. A statutory change was needed to give the Census Bureau access to the DSF (see below), and the Census Bureau and USPS had to agree on and implement a standard format for the representation of mailing addresses. The implementation took place early in 1994. In June 1994, the Census Bureau obtained its first copy of the DSF, the May 1994 version. However, because the USPS was not authorized to let others retain the information in the DSF, the Census Bureau could not keep these addresses. The agency used this DSF to test its ability to match the information in the file to both the ACF and the TIGER database. By special agreement with the USPS, the Census Bureau was allowed to use the May 1994 DSF as a source for updating the ACF to create a MAF for the few areas enumerated via the mailout/mailback (MO/MB) methodology for the 1995 test census.⁹

As part of the agreement, the Census Bureau provided the USPS with approximate latitude/longitude coordinates for the addresses that GEO could match to its records in the TIGER database. The USPS planned to use this information to help automate a restructuring of its delivery routes. The Census Bureau found that it could match—and therefore geocode—almost 70 million city-style addresses from the DSF to street/road names and address ranges in the TIGER database. The addresses it could not geocode exposed two possible situations: (1) a shortage of street features, street/road names, and/or address ranges in the TIGER database and (2) erroneous addresses in the DSF. The latter reflected addresses that no longer existed or had been misrecorded by local post offices when they prepared the list of city-style addresses for their area. Based on the match, the Census Bureau created a tally of addresses that was used to estimate workloads for the task of having the regional offices (ROs) and regional census centers (RCCs) try

⁷ U.S. Census Bureau, Census 2000 Information Memorandum No. 102, "Program Master Plan: Census 2000 Master Address File," February 28, 2001, cover memorandum dated May 1, 2001.

⁸ U.S. Census Bureau, "Census 2000 Topic Report No. 8: Address List Development in Census 2000," March 2004, pp. 1–6, 25.

⁹ Memorandum of understanding between U.S. Census Bureau and U.S. Postal Service, June 1994.

to resolve the unmatched addresses; i.e., those GEO could not geocode. The information on non-matching ranges of addresses also was used to begin the TIGER Improvement Program (TIP) and Master Address File Geocoding Office Resolution (MAFGOR) operations.¹⁰

Public Law (P.L.) 103-430, the Census Address List Improvement Act of 1994, directed the USPS to give the Census Bureau the information it needed to carry out its periodic censuses and surveys. Its passage on October 31, 1994, enabled the two agencies to come to an agreement regarding the Census Bureau's use of the DSF addresses for census purposes; the agencies signed the formal memorandum of understanding on June 1, 1995.¹¹ Later that month, the Census Bureau obtained an April 15, 1995, version of the DSF. GEO now could use this file to upgrade and expand the ACF, supplementing the addresses already in that file. Where GEO found that some ACF addresses were similar but not identical to those in the DSF, it used the USPS version of the addresses to improve the "deliverability" of the questionnaires to be sent through the mail. GEO also used the information to update the inventory of nonmatching cases that the Census Bureau had to attempt to resolve through both the TIP and MAFGOR operations.

The Census Bureau did not want to get a copy of every DSF as it was issued. Instead, it obtained a DSF on request from the USPS in April and September 1996, May and November 1997, September 1998, and April, September, and November 1999.¹² Also, the Census Bureau used the information in some DSFs only selectively, depending on impending operations. For example, it used the September 1996 DSF as a source for updating the MAF for the dress rehearsal in Sacramento, CA, and the area within the Columbia, SC, MO/MB area.

Because some post offices were as much as 6 months and more late entering new addresses into the DSF and because some letter carriers did not provide information in the proper way to ensure that addresses were added to the USPS database, the file did not reflect new residential occupancy and construction consistently for all post offices.¹³ In June 1999, the USPS informed the Census Bureau that it would make a special comprehensive effort to update the DSF in July. Accordingly, the USPS implemented:

- National Edit Book Week, a week-long national initiative (June 19 to 25, 1999) during which every carrier validated his/her route's address information and reported all incorrect and missing information. The results appeared in the September 1999 DSF.¹⁴
- Edit Book Track Software II, a new and improved tracking system that the USPS began using in July 1999 to enable it to monitor the address reporting activity for all routes in the nation on a monthly basis.
- Requiring post offices to report addressing activity monthly, including reporting of no activity; previously, post offices could report the information quarterly.
- A new software program that, on a flow basis, evaluated the approximately 40 million change-of-address records received annually from postal customers. The goal was to identify addresses that were not in the DSF database or were flagged as nondelivery or vacant locations.
- An additional step in its Address Element Correction service, a computer program that improved the presentation of addresses, to attempt to resolve addresses that the Census Bureau could not match to its database. For example, of the 4,833 addresses added as a result

¹⁰ U.S. Census Bureau, "The Census Bureau's Master Address File (MAF): Census 2000 Address List Basics," March 1999 and "MAF BASICS 2000," undated, available at <<http://www.GeographyDivision.census.gov/mob/homep/mafbasics.html>>. See Chapter 7, "Census Geography and the Geographic Support System," for descriptions of TIP and MAFGOR.

¹¹ Memorandum of understanding between U.S. Census Bureau and U.S. Postal Service, signed by Robert G. Krause on behalf of the USPS on June 1, 1995, and by Joel L. Morrison for the Census Bureau on May 31, 1995.

¹² However, it did not process the April 1999 file because the costs and operations involved could be expected to duplicate already geocoded information the Census Bureau was getting from the LUCA and block canvassing operations.

¹³ For example, addresses added by USPS letter carriers in preparation for the dress rehearsal revealed that 430 addresses still did not appear in the DSF 7 months later.

¹⁴ The USPS performed National Edit Book Week again during the week of January 10, 2000, with the added addresses included in a "transaction file"—a file of "postal route activity" that reported only mailing addresses the USPS had added to its records since the previous DSF—rather than providing another complete DSF. The USPS provided the transaction file electronically to the Census Bureau in the first week of February 2000.

of the casing check (an identification of addresses for which letter carriers did not have a preaddressed questionnaire to put in their sorting case of the addresses on their route) for the dress rehearsal, the Census Bureau was unable to match 1,445 (30 percent) against the DSF. By imposing this program, the USPS found and improved 1,015 (70 percent) of these addresses. (The other 430 were the aforementioned addresses that apparently were not in the DSF.)

As a result, subsequent DSFs were more complete than the previous versions. The last complete DSF the Census Bureau received in time to be used in Census 2000 was an April 2000 version (received on April 20). This allowed the agency time to unduplicate new residential DSF addresses against the addresses provided by the New Construction program (see New Construction program section in this chapter) and to try to geocode them in time for enumeration during Coverage Improvement Follow-up (see Coverage Improvement Follow-up section in this chapter).

The DSF became larger with each delivery as a result of new residential construction, automation of additional post offices, and establishment of city-style mailing addresses in areas that did not previously have them. Because of the time needed to run this file, the Census Bureau considered using the USPS's monthly record of added and deleted addresses instead. In the end the Census Bureau decided to process updated DSFs and planned to continue to do so after Census 2000 to help keep its address file current for use in future operations.

ZIP+4 file. Since the 1980s, the USPS has sent the Census Bureau the ZIP+4 file, a computer file of about 28 million address ranges (and their related street or road names) with their associated ZIP+4 codes. In preparation for Census 2000, GEO matched the street (or road) name/address range records in this file to street/road name and address range records in the TIGER database. This provided the database's address ranges with 4-digit ZIP add-on codes and helped identify missing address ranges. However, inclusion of the ZIP+4 information in the database added many additional address range breaks, because changes in a ZIP+4 code can occur anywhere along a line segment. As a result, the Census Bureau removed the codes from the file in 1995. It did use the ZIP+4 file to update the 9-digit ZIP Codes recorded in the MAF whenever it updated the MAF from an address source. Nevertheless, it did not use the ZIP+4 codes associated with the addresses in the MAF for the Census 2000 mailout of questionnaires. Instead, the agency relied on the vendors who performed the mailout operation to add this item to the postal addresses. Beginning in 1993–94, GEO did use the ZIP+4 file as the source for inserting 9-digit ZIP Codes into each release of the TIGER/Line files. The ZIP+4 file also provided the basis for processing the Automated Address Range Program (see Chapter 7).

The USPS also maintained a computer file in which it recorded monthly updates and revisions to its 5-digit ZIP Codes. GEO used this file to update the ZIP Code information in both the TIGER database and the MAF, a process called Automated ZIP Code Update/Recode. The USPS also regularly provided the Census Bureau with a copy of its Delivery Statistics File, which GEO used to provide the approximate number of addresses by ZIP Code to the planning and control operations that required such information. In addition, the USPS provided another of its standard monthly products, the City-State File, which related each 5-digit ZIP Code to its post office name. Because the MAF addresses included only ZIP Codes, this file enabled the Census Bureau to derive the post office names for printing on questionnaire labels and address listing pages.

In addition to the information obtained from the USPS, GEO also obtained a Block-to-ZIP File from Geographic Data Technology, Inc., with the agreement that the Census Bureau would use the file only for internal purposes. This September 1997 file served to identify the functional extent of ZIP Codes for precensus operations, based on 1990 census blocks; at the time, the agency's own records of ZIP Codes were neither complete nor reliable. The Census Bureau used the file to help determine "blue line delineation" (see "Blue Line Delineation" section in this chapter), target areas for mapping update activities, etc. The agency also obtained an April 1999 version of the file to improve its ability to provide ZIP-related information for precensus field operations.¹⁵

¹⁵ This was an extension of an existing, 5-year cooperative research and development agreement (CRADA) announced on November 18, 1996 (see U.S. Census Bureau, "Census Bureau, Geographic Data Technology Launch New Geographic Data Initiative," CB96-19) and the CRADA agreement signed on November 13, 1996.

As a result of the above operations, GEO created the initial MAF, which covered only type of enumeration area (TEA) 1,¹⁶ in early 1998. Subsequent field operations provided the addresses for other areas. From time to time, an extract of geocoded residential mailing addresses from the MAF was provided to the Decennial Systems and Contracts Management Office (DSCMO), which added fields for information it needed to control and track the census. This was called the decennial master address file (DMAF). It was used for Census 2000 to identify the housing units that would be sent the sample questionnaire, to prepare a file from which contractors could print address labels for the census questionnaires, and to assign identification numbers to addresses. The DMAF also supported other purposes, including response check-in, tracking and reporting of activities related to individual addresses, and the universes for follow-up operations. GEO delivered the first MAF extract to the DSCMO on a flow basis during July 1999 for 39 counties and statistically equivalent entities covered by the American Community Survey; the Geography Division delayed the second delivery until August 15 so that updates for counties in which the Census Bureau was doing a late field check of addresses related to the Local Update of Census Addresses (LUCA) program (see LUCA section in this chapter) could be included. Additions, deletions, and corrections flowed into the MAF from census operations and Delivery Sequence Files; new and revised addresses were geocoded automatically where possible, and map spot information was recorded for addresses located outside the MO/MB area. This information was used to update the DMAF from time to time. GEO delivered the last MAF extract for use in data collection on September 9, 2000, and the final tabulation extract, which included the tabulation blocks to facilitate tabulating and presenting the data, in November 2000. Later that month, the DSCMO provided GEO with the final status (i.e., in or out of the census) of all addresses in the DMAF. Note that as of March 2001, some 27,844,000 MAF addresses had not been delivered to the DMAF: 2.4 millions were coded as duplicates, 11.2 million could not be located and therefore could not be geocoded, 3.9 million were considered to be invalid, and 8.2 million were nonresidential; another 2.1 million were not transmitted for other reasons. Some of these may have been delivered with good information to the DMAF after being recorded from various field operations.¹⁷

Special Places/Group Quarters

Special places represent situations where unrelated people live together in housing different from the typical house, apartment, etc.; group quarters are the individual residential facilities within special places. Examples of group quarters include dormitories on a college campus and wards in a prison or hospital. Nursing homes and motels are examples of special places, but in Census 2000, the Census Bureau treated the same facility as both a special place and a group quarters. Some facilities that consisted only of housing units, such as campgrounds, also were treated as special places. As noted earlier, the Census Bureau decided not to re-use the ACF addresses for these living quarters. From April 1996 through May 1997, the Population Division updated its inventory of these facilities from various sources. From November 1997 through June 1998, it created such an inventory for Puerto Rico. In seven batches from late February through mid-August 1999, GEO geocoded as many of the addresses as it could. However, because the existence of the special places and their addresses had not been verified, GEO did not add the addresses to the MAF at this time. Using maps produced from the TIGER® database, census personnel from the RCCs made personal visits—as part of the Census 2000 Facility Questionnaire Personal Visit Operation—from late April through early November 1999 to obtain selected information about the special places and their group quarters, including verifying and correcting the address. They also mapped the location of those that did not have a city-style mailing address, as well as selected

¹⁶ Type of enumeration area referred generally to the way addresses in an area received their mail. Type 1 TEAs generally consisted of addresses identified by street number/street name and with mail delivered by the USPS.

¹⁷ U.S. Census Bureau, "Program Master Plan: Decennial Master Address File (DMAF)," Census 2000 Informational Memorandum No. 51, June 20, 2000; Miriam D. Rosenthal, "Census 2000 and the U.S. Postal Service Delivery Sequence Files," in *Proceedings of the Annual Meeting of the American Statistical Association*, Atlanta, GA, 2001; Frank A. Vitrano, Robin A. Pennington, and James B. Treat, *Address List Development in Census 2000, Topic Report No. 8*, TR-8 (Washington, DC: U.S. Census Bureau, 2004); and Robin A. Pennington and Cynthia Rothhaas, "Final Status of Addresses on the Census 2000 Address List: Analysis of the Address List-building Process," in *Proceedings of the Annual Meeting of the American Statistical Association*, August 5-9, 2001.

ones in MO/MB areas. From late November to mid-December 1999, GEO inserted the addresses into the MAF, and then attempted to geocode them. However, some local census offices (LCOs) later submitted information for 324 additional special places/group quarters in 54 counties, barely in time for inclusion in the enumeration. The DSCMO, in late August 2000, sent these addresses to GEO to match, geocode, and enter into the MAF, and then deliver to the DMAF.

Using the information shown on Census Bureau maps and lists that incorporated the information from this operation, the Field Division's local knowledge update operation performed a similar, subsequent review at the LCO level in January and February 2000. This took advantage of the personal knowledge and detailed sources (e.g., telephone and other directories) available at this local level. GEO subsequently inserted the new information into the MAF, and then geocoded the city-style addresses for use in the census.¹⁸

Blue Line Delineation

The "blue line" is a boundary that separates groups of census blocks in which the vast majority of housing units receive their mail at city-style addresses from areas in which non-city-style addresses predominate. Areas inside the blue line are those the Census Bureau can include in the MO/MB census because the agency can prepare a computerized file of geocoded city-style addresses to be used for mail delivery of questionnaires in that area.¹⁹ From late 1995 through the first half of 1996, GEO computers identified a preliminary blue line for Census 2000. It was based on the 1990 Tape Address Register (TAR) area—the area in which the Census Bureau was able to take the 1990 census by mail—plus ZIP Codes that had more than 90 percent city-delivery addresses. Then it was expanded to include blocks that contained a predominance of city-style mailing addresses in other ZIP Codes based on street and address-range information that had been added to and corrected in the TIGER® database and on geocoded city-style mailing addresses that had been added to the MAF from the DSF.

The database's 6.96 million blocks and the related 102.4 million housing units (HUs) at this point fell into the following categories:

- Inside the blue line: 3.4 million blocks (49 percent), 79.84 million HUs (78 percent).
- Outside the blue line: 2.4 million blocks (35 percent), 13.84 million HUs (13.5 percent).
- Needing further research (blocks with 50 to 90 percent city-style addresses): 1.1 million blocks (16 percent), 8.6 million HUs (8.4 percent).
- No ZIP Code match (and therefore also needing research): 12,306 blocks (0.2 percent), 113,070 HUs (0.1 percent).

The TIGER database was able to display on maps the location of the blue line and to identify the blocks that required further research. The regional office geographic staff could view this information on their computer terminals, which enabled them, beginning late in 1996, to adjust the initial

¹⁸ U.S. Census Bureau, Census 2000 Information Memorandum No. 41, "Program Master Plan: Census 2000 Group Quarters Enumeration," February 1, 2000, cover memorandum dated February 22, 2000; Census 2000 Information Memorandum No. 69, "Program Master Plan: Census 2000 Local Update of Census Address Special Place Program," July 21, 2000, cover memorandum dated August 28, 2000; Census 2000 Information Memorandum No. 113, "Program Master Plan: Census 2000 Special Place/Group Quarters Inventory Development," July 2001, cover memorandum dated September 10, 2001; Kimball Jonas, "Group Quarters Enumeration," Census 2000 Evaluation No. E.5, Revision 1, August 6, 2003; and Florence Abramson, *Special Place/Group Quarters Enumeration, Topic Report No. 5*, TR-5 (Washington, DC: U.S. Census Bureau, 2004).

¹⁹ The limit of the mailout/mailback (MO/MB) census is referred to as the "blue line" because blue pencil was used to delimit this area when such a boundary was drawn for the first time for the 1970 census. Some housing units (HUs) within the MO/MB area choose to use a post office box for their mail delivery. For such an HU, if mail is addressed to its house-number/street-name address (as the census questionnaire inevitably would be, because that is how the Census Bureau records the address in the MAF), the USPS will return the mail to the sender as "undeliverable as addressed." Therefore, for Census 2000, the questionnaire was returned to the Census Bureau. The HU then became part of the universe of HUs that were visited by enumerators in follow-up operations. Another problem in MO/MB areas related to last-minute wholesale changes of addresses in an area. In order to avoid duplicate mailings to the same address, the MAF retained the old addresses. The USPS continued to deliver mail to such addresses for at least 1 year after implementing the changes.

blue line interactively in the database to include blocks that they knew had, or soon would have, a predominance of city-style mailing addresses (even though these blocks might not be on city delivery routes) and to delete blocks where they knew this was not the case, or where individual blocks were isolated from the rest of the MO/MB area. They also could adjust the blue line to take into account the type of development (if any) in a block and the validity of individual excluded blocks within the blue line, as well as to “smooth” this boundary by eliminating unusual indentations and protrusions. The result was a set of initial blue lines that delimited the boundary between areas for which the Census Bureau would perform operations such as address listing (outside) and verifying the agency’s inventory of city-style addresses (inside). This refinement process basically was completed by mid-1997, but adjustments continued into early 1998. At that time, a total of 2,096 counties contained area within the blue line, of which 173 were entirely within the blue line. The Census Bureau estimated that about 94 million addresses (80.5 percent of all HUs) were located within the blue line.

The enlargement of the area within the blue line, which was also known as type of enumeration area (TEA) 1, enabled the Census Bureau to geocode city-style addresses automatically for a larger area than before. This concomitantly reduced the area, and the number of living quarters (LQs), for which the Census Bureau had to obtain and geocode addresses by address listing, where enumerators must visit each HU to leave a census questionnaire or enumerate the HU.

After completion of the address listing operation, the Census Bureau had planned to identify by computer a small number of address-listed census blocks in which virtually all the HUs received their mail at city-style addresses. The geographic staff in the RCCs would review these blocks to consider whether it would be appropriate to include any of them within a redefined final blue line. However, this plan was dropped when the Census Bureau determined that the process would have required major, time-consuming development of new software.

When the Census Bureau was preparing the address lists for the LUCA program, it found problems with the addresses in some blocks. Accordingly, after the geographic staff reviewed these blocks, they shifted many of them into the address listing and update/leave (U/L) areas; these blocks constituted an additional phase—Wave 4—of the address listing operation. To specifically identify these blocks in the TIGER database, the Census Bureau reclassified them from TEA 1 to TEA 9, which revised the location of the blue line in selected counties to encompass a somewhat reduced area. The final number of counties that included area within the blue line (TEA 1) was 2,121, of which 147 were entirely within the blue line.²⁰

Filling the Gaps in the Address File

The Census Bureau soon discovered that the DSF did not contain every residential city-style address in the MO/MB areas, so it had to take steps to identify the missing addresses. The agency undertook a number of programs to locate sources that might provide the missing addresses for the MAF and, after geocoding, for the DMAF for use in Census 2000. The Census Bureau also initiated several programs that would ask local and tribal governments (the agencies that usually assign both street/road names and structure addresses) to help the Census Bureau expand and improve the content of the MAF.

Address System Information Survey (ASIS). Conducted in 1993 and again in 1996, the ROs undertook this telephone survey to try to determine (1) the types of addresses (city-style and non-city-style) that existed in a county or, for New England, in a city (place) or town (minor civil division), (2) whether the city-style addresses were used for mail delivery, (3) whether street/road names and city-style addresses were displayed where they exist (i.e., street signs at intersections and house numbers on structures), and (4) whether city-style addresses were being established or

²⁰ U.S. Census Bureau, “Program Master Plan: Census 2000—1998 Address List Review Program,” Census 2000 Informational Memorandum No. 32, November 23, 1999; U.S. Census Bureau, “Program Master Plan: Address Listing Operation,” Census 2000 Informational Memorandum No. 80, November 14, 2000; and U.S. Census Bureau, “Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs,” Census 2000 Informational Memorandum No. 140, July 21, 2003.

expanded to replace non-city-style addresses in all or part of the governmental unit (GU). The survey was limited to those GUs for which the Census Bureau's records showed more than 5 percent of the mailing addresses to be non-city-style, or that reported in previous surveys that a portion of the GU was served by non-city-style mailing addresses. The 1993 survey covered 2,775 counties, but the number dropped to 2,153 counties for the 1996 survey because GEO had learned, either from the 1993 ASIS or subsequent information, that many counties had changed their address system to city-style addresses.

The purpose of the survey was to determine the appropriateness of including all or parts of a county in the Census Bureau's efforts to obtain city-style addresses and address-range information (where this information was not available already) and, as a corollary to that, the best methodology to use for conducting Census 2000 in the county. The surveys revealed that almost 1,800 counties recently had converted, or planned to convert by the year 2000, some or all of their addresses from non-city-style to city-style.

In March 1999, the Census Bureau decided that it would not update its files as the result of any new city-style addressing systems that were brought to its attention. The old address system was already included in the MAF and TIGER®, and the agency did not know unequivocally which specific addresses had been superseded. It did not want to simply include the new addresses at this stage, because this could result in mailing two questionnaires to many residences.

Rural Addressing Program (RAP). This activity was intended to identify areas with new city-style address systems, to implement adding and incorporating these addresses into the MAF and TIGER, and to consider the feasibility of using local information to insert geocodable non-city-style addresses into these two files, primarily by using rural directories and atlases. Input came from the 1993 ASIS. GEO obtained about 400 directories and atlases, but after extensive review and discussion of the various aspects of the program by a committee and several working groups composed of staff of the Geography and Field Divisions and other interested divisions, the Census Bureau decided not to pursue the matter further. The information-gathering aspect of the program was replaced by the 1996 ASIS.

Program for Address List Supplementation (PALS). In an effort to build and update its list of city-style mailing addresses, the Census Bureau decided to ask for assistance from state, local, and tribal governments, councils of government, and metropolitan and regional planning agencies. It announced the program in an August 1996 mailout conducted by the Data Preparation Division (DPD). The announcement asked that recipients return a form to indicate their interest in participating. The partnership specialists at the ROs also contacted GUs in an attempt to encourage them to take part in the program. The Census Bureau asked that a GU submit a current address list, preferably only city-style residential addresses in computer-readable form, to the RO that served its area. However, the ROs would accept a paper list if that was the only option. A GU that was participating in the TIGER improvement program was asked to hold the list until it had completed its work on that program, because that would improve the success of the match of the address list to the address ranges in the TIGER database. The agencies were permitted to submit multiple lists, simultaneously or over a period of time, if they served more than one GU or were able to follow up with updated or expanded files.

The plan was that when an RO received a computer-readable list, it would process the list into a standardized format prescribed by the GEO if the submitting agency had not already done so. This would facilitate the match of the addresses, first against the MAF and then to the TIGER database. The ROs were to send paper lists to the DPD, where clerks would key the information into computer files. The DPD was to send the files to the ROs for formatting and then transmission to the GEO for the matching operation. After processing a list, the Census Bureau would return a disposition list to the contact person at the GU who could see how the agency dealt with each address.

Receipt of address lists began in spring 1997. However, after reviewing the lists from several hundred governments, the GEO determined that it could not deal effectively or efficiently with the variety of formats and the significant number of nonstandard address conventions in these materials. The Census Bureau decided to drop this effort to update and correct the MAF in favor of obtaining such information from the LUCA program (see the next section). The ROs telephoned

and followed up with a letter to each participant detailing this change in plans. Nevertheless, the Census Bureau reformatted and processed many of the files it received so the addresses could be matched against the MAF, and it provided a disposition listing of the submitted addresses to those GUs that wanted the opportunity to see what difficulties the Census Bureau had with its file. These disposition listings could be useful to the GU in preparation for the official address review for the LUCA program. The PALS addresses for Sacramento did prove to be compatible with the requirements, so the agency added those addresses to the MAF in preparation for that city's inclusion in the Census 2000 Dress Rehearsal.²¹

Addresses From Precensus Operations

In addition to the specific programs that used local sources to find mailing addresses to add to the MAF, the Census Bureau undertook several address-related field operations in preparation for Census 2000. Unlike previous censuses, the agency planned to carry forward all the address information derived for and from Census 2000 for use with its future censuses and surveys.

Test censuses. The Census Bureau conducted a census test in three areas in 1995 (Oakland, CA; Paterson, NJ; and six rural parishes in northwestern Louisiana). It also did preparatory work for New Haven, CT, but eventually dropped this city from the test for budgetary reasons. The Census Bureau conducted test censuses for three more areas in 1996: in two American Indian entities (Acoma Pueblo and off-reservation trust land, NM, and Fort Hall Reservation, ID) and in seven scattered census tracts in Chicago.

Map and address range updates and corrections from precensus GEO coding operations in the urban sites were entered into the TIGER® database, but not those resulting from the actual test censuses. As noted earlier, the changes to map features as a result of the address listing operation in Louisiana were entered into a special benchmark file, but, due to time constraints, GEO did not insert them into the database. Census Bureau staff also recorded map spot information in the benchmark file so that appropriate maps could be generated for subsequent operations in the test census, but did not enter that information into the database itself. The DPD inserted into the MAF addresses that had been added, deleted, and corrected as a result of the various operations carried out prior to, but not as a result of, the test censuses.

Dress rehearsal. Street and address information added, deleted, and corrected for the various operations carried out in 1997–98 for the Census 2000 Dress Rehearsal was added to the MAF and the TIGER database. For the dress rehearsal, the Census Bureau for the first time digitized the map spots (and their numbers) into the TIGER database so that maps printed for subsequent operations would have the information.

Address listing. For the 1995–96 test censuses, the Census Bureau sent staff into the field with address registers and census block maps. Agency instructors taught the listers to record specific information about the mailing address and location of every living quarters in their assigned areas. In March 1998, the Census Bureau began listing addresses outside the early blue line—i.e., in areas classified as TEA 2—for the 39 counties included in the American Community Survey in 1999. For Census 2000, the Census Bureau listed addresses in all or part of 2,944 additional counties, including 78 municipios in Puerto Rico. The listing took place in three waves during 1998: July 30–September 11, October 8–November 19, and November 9–December 18. Address listers conducted a fourth wave for those blocks reclassified as TEA 9 (see Chapter 7, “Census Geography and the Geographic Support System”) in three subwaves from February 2 to May 21, 1999, with data capture completed by the end of June. For the national listing operation, the Census Bureau did not relist addresses in Menominee County, WI, and the 11 counties in South Carolina whose addresses were listed, and subsequently checked and updated during the U/L operation, for the dress rehearsal.

Many of the mailing addresses in TEA 2 were non-city-style, even where Living Quarters (LQs) had house-number/street-name addresses that enabled emergency services and others to locate a residence quickly and systematically. The Census Bureau estimated that there would be about 22 million HUs in the address listing areas, or 19.1 percent of the nation's housing. The work of listers

²¹ U.S. Census Bureau, “The Census Bureau's Master Address File (MAF): Census 2000 Address List Basics,” March 1999, pp. 10–11.

included listing specific information for each habitable residential structure on address listing pages in an address register, assigning a map spot number and mapping a map spot and its number for each residential structure, and updating and correcting the block maps. The National Processing Center (NPC) keyed the addresses and their map spot numbers into a master address file update file (MAFUF) and inserted map changes into the TIGER database.²²

Block canvassing. For the Census 2000 Dress Rehearsal, the Census Bureau checked addresses inside the blue line only at selected multiunit structures (targeted multiunit check [TMUC]) and in specific blocks where it believed that the agency's list of city-style mailing addresses was likely to be incomplete (targeted canvassing [TC]). These two special, one-time operations were replaced by block canvassing for Census 2000 because the Census Bureau determined that it needed to perform a full-scale canvass of addresses for all blocks within the initial blue line—just as it had done in the prec canvass operation for the 1990 census. This would ensure that, for the areas in which the USPS delivers virtually all mail to city-style addresses, the agency had accurately recorded every residential mailing address and the block in which each was located. However, the NPC did key the address additions, deletions, and corrections from the TMUC and TC operations so they could be entered into a MAFUF and then applied by the GEO to the MAF.

Beginning in January 1999, block canvassing took place in areas classified as TEA 1 in all or part of 2,096 counties. Only 147 of these counties were coded entirely to TEA 1 and therefore were block-canvassed in their entirety. Block canvassing also took place in TEA 6, which applied to pre-identified military bases located in TEA 2 areas. In addition to verifying the completeness and accuracy of the Census Bureau's mailing list, the field staff updated and corrected the TIGER-based maps to reflect what they found on the ground. The work took place in three waves based on expected weather conditions in the various parts of the nation. (The number of addresses provided from the MAF by the GEO to the DSCMO for printing in the address registers used for block canvassing appears in parentheses.)

Wave 1: mid-January–beginning of February 1999 (33 million, or 35 percent)

Wave 2: mid-March–mid-April 1999 (44 million, or 47 percent)

Wave 3: mid-April–mid-May 1999 (17 million, or 18 percent)

The regional census centers (RCCs) and about 90 census field offices conducted the first two waves; early opening local census offices (LCOs) carried out Wave 3 and a later supplemental Wave 4. The total number of addresses in the three waves was more than 94.3 million. Although every residential structure on the ground was to be checked to ensure that its address appeared on a listing page, the enumerators were given special instructions for this operation. They were to try to get an interview with an inhabitant to check the address of every multiunit structure, of every HU without a house number as part of its mailing address, and at one of every three listed freestanding single-family houses. In the latter case, when an enumerator visited a designated address he or she verified the addresses of the two adjacent houses and the number of HUs at each address. If an address did not appear on the list, the enumerator conducted an interview and, if necessary, recorded the missing structure's address. Using an excerpt of the DMAF, the Technologies Management Office flagged every address to be visited and identified each one with an asterisk next to the address on the address listing page in the address register.

The block canvassing operation provided 9.5 million additional residential addresses and 69,500 additional special place addresses, as well as 2.4 million corrections and over 8.2 million doubtful addresses (nonexistent, uninhabitable, duplicate, nonresidential, etc.). Because the Census Bureau did not want to discard possibly good addresses that the enumerators had misclassified, but also wanted to have the cleanest address list possible, the agency checked the accuracy of an estimated 1.4 million deleted addresses by including them in the LUCA Field Verification operation

²² U.S. Census Bureau, "Program Master Plan: Census 2000 Address Listing Operation," Census 2000 Informational Memorandum No. 80, November 14, 2000; Megan C. Ruhnke, "The Address Listing Operation and Its Impact of the Master Address File," Census 2000 Evaluation No. F.2, January 30, 2002; and Frank A. Vitano, Robin A. Pennington, and James B. Treat, "Address List Development in Census 2000," *Census 2000 Topic Report No. 8*, March 2004.

(see LUCA section below). It also had to establish special rules for dealing with a significant number of added addresses that matched addresses already in the MAF but were assigned to a different census block, or addresses for apartment buildings or trailer courts that were identified as single-family HUs.

The NPC keyed the address updates and revisions into MAFUFs and inserted map changes into the TIGER database. Revisions to the address-to-block-number relationship, which were recorded in the MAF, were used to correct the address range information in the TIGER database, thereby assuring consistency with the MAF. To ensure the accuracy of this information, the Census Bureau imposed a “reconciliation edit” on the block canvassing information to identify and resolve discrepancies between the block canvassing MAFUF and the geographic records in the database. Using a block canvassing MAFUF, the block canvassing address registers, and the assignment area (AA) maps, staff in the NPC reviewed disposition lists that identified the mismatches. Mismatches included several basic situations:

- The block/feature-name combination for an added address did not match the TIGER database.
- The lister did not provide a block number.
- An apartment building or trailer park used a name rather than a house-number/street-name address.
- An HU was located in a block offset from the address’s street feature.
- A feature name was spelled differently from its listing in the TIGER database.
- The name of an added feature did not appear in the TIGER database.

The NPC resolved about 645,000 addresses, and flagged unresolvable cases, which they referred to the RCCs’ geographic staffs for resolution by creating “key geographic locations” or by using the MAFGOR process and field revisits. The RCCs revised and updated the MAF and the TIGER database with information obtained from the block canvassing operation through July 1999.²³

Post-Block Canvassing TIGER® Update (PBCTU). The NPC flagged edit problems that they could not resolve. From April through July 2000, the PBCTU operation continued the review of the nonmatch disposition lists, followed by an integrated update of the MAF and the TIGER database based on the findings of that review. Field Division (FLD) submitted just over 650,000 unresolvable problems to the RCCs for resolution, primarily via reference to MAFGOR materials. The RCCs reviewed only those records that had already been researched during the previous update of the TIGER database or that had been checked in the field and required a revision of the MAF rather than TIGER. They updated only the block numbers and street/road names associated with almost 300,000 addresses in the MAF; no TIGER updates were performed at this stage. The residual cases were deferred for further review based on the output from the edits for the Automated Address Range Program (AARP) operation. Completion of the PBCTU enabled the GEO to proceed with the AARP in time for an updated database to be available for the coverage improvement follow-up operation. FLD had requested that the results be included in time for the nonresponse follow-up operation, but requirements of other projects prevented the GEO from doing so.

American Community Survey (ACS). The Census Bureau undertook this post-Census 2000 survey in order to provide annual current data for the social and economic characteristics of the population of the nation and selected geographic entities. However, the agency began the survey on a test basis in 4 counties in November 1995 and in 36 counties beginning in 1999. It conducted the Census 2000 Supplementary Survey using ACS methodology in 1,203 additional counties during 2000 so it could compare national and state estimates with the data from the Census 2000 long-form questionnaires. These ACS field operations used maps derived from the TIGER database and a sample of addresses selected from the MAF. The field work revealed a small number of addresses that did not exist or had changed. These corrections were not carried to the MAF

²³ U.S. Census Bureau, “Block Canvassing Operation Requirements Overview,” June 1, 1998; “Census 2000 Block Canvassing Operation,” Census 2000 Informational Memorandum No. 10, April 13, 1999; and Joseph A. Burcham, “Block Canvassing Operation,” Census 2000 Evaluation No. F.5, April 5, 2002.

or TIGER for Census 2000 because it was anticipated that they would duplicate corrections found during regular census operations; furthermore, they were not considered to be part of Census 2000. The ACS field staff also noted the need for a few corrections to the map information, but there was no mechanism for reporting this officially or carrying it into TIGER.²⁴

Local Update of Census Addresses (LUCA) (also referred to as **Address List Review**). Until Congress passed P.L. 103-430, the Census Address List Improvement Act of 1994, it was illegal for the Census Bureau to show its address list to anyone who was not a sworn agency employee. One purpose of this legislation was to ensure a more accurate census by authorizing the USPS to provide as much address and related information and assistance to the Census Bureau as possible. In addition, the legislation allowed local and tribal government officials the opportunity to review previously restricted address information so they could improve the accuracy and completeness of the Census Bureau's address list. However, because the addresses continued to be covered by Title 13 of the U.S. Code, the reviewers had to comply with the agency's confidentiality requirement; i.e., although they could review the addresses, they could not share them with anyone else, nor were they allowed to use them to update or improve their own records or to take any enforcement action. The people who expected to work with the address materials for the local and tribal governments had to sign a confidentiality agreement before the Census Bureau would allow a governmental unit (GU) to participate in the program; in addition, anyone who subsequently worked with the materials had to sign the agreement first. The GU provided the appropriate RCC with the signed confidentiality agreement, followed by updated copies to cover any additional people who worked with the addresses. The Census Bureau asked each GU to identify one person to serve as the primary liaison for the program.²⁵ The program was officially referred to as Address List Review, but it was more popularly known by the acronym LUCA (for Local Update of Census Addresses).

The benefits of participating in the LUCA program were several. Most important was that local and tribal officials had an opportunity to review the Census Bureau's addresses and maps before the census took place. Possible errors identified and reported at this stage were relatively easy to check and correct if necessary; once past this stage, problems could be more difficult to resolve. Furthermore, the officials who chose to participate developed a better understanding of the procedures and concepts involved in taking a census. A considerable amount of goodwill and understanding developed between the participants, the state and metropolitan agencies assisting them, and the Census Bureau as a result of the interaction that took place during this operation. Although many GUs chose not to participate, those that did contained an estimated 85 percent of all addresses in the United States. Those that did not participate, but reviewed the materials, became aware that the census was imminent and that the Census Bureau had made an effort to let them help improve it and to show them how they might contribute in the future; a nonparticipating GU could also make arrangements for a participating GU or agency to include the area when the latter performed its review.²⁶

The Census Bureau first tested the LUCA program in the 1995 test census sites and the 1996 Chicago and Acoma Pueblo test sites, and did so again for the dress rehearsal sites. The LUCA for the test sites was carried out by the DSCMO, which controlled the address file at this time (subsequent address list and map reviews were under the auspices of the GEO). These reviews, which began 8 months prior to the census tests, included the same operations discussed below for the Census 2000 LUCA, with the exception of an appeal process. For the test censuses, all five areas participated. For the dress rehearsal, both the city of Sacramento and the Menominee tribe agreed to participate in LUCA, but only 31 of the 60 eligible GUs in the South Carolina site participated in

²⁴ U.S. Census Bureau, "Meeting 21st Century Demographic Data Needs—Implementing the American Community Survey: July 2001," Report 1: Demonstrating Operational Feasibility.

²⁵ See U.S. Census Bureau, "Local Update of Census Addresses (LUCA) Program—Address List Review: Confidentiality and Security Guidelines," and U.S. Census Bureau, *LUCA Technical Guide*, Chapters A-2, A-9, and B-4.

²⁶ U.S. Census Bureau, "Program Master Plan: Census 2000–1998 Address List Review Program," Census 2000 Informational Memorandum No. 32, November 23, 1999; U.S. Census Bureau, "Program Master Plan: Census 2000 Master Address File," Census 2000 Informational Memorandum No. 102, May 1, 2001; and Karen L. Owens, "Evaluation of the Local Update of Census Addresses 98 (LUCA 98), Census 2000 Evaluation F.3." April 16, 2003.

LUCA; however, because of the participation of the city of Columbia, SC, the participating GUs contained 98 percent of the HUs enumerated for the 1990 census. After the completion of LUCA, but before the census tests, Census Bureau representatives visited each test site for a debriefing in which participants provided feedback as to how LUCA might be improved.²⁷

For Census 2000, the Census Bureau invited local governments and American Indian tribes that were recognized by the federal government and had a land base (i.e., a reservation and/or off-reservation trust land) to verify the accuracy and completeness of their portion of the agency's address file and to review, update, and correct the agency's map information. This included the tribes in Oklahoma, even though only the Osage Tribe had an officially designated land base. Those tribes and local governments that expressed interest in the program were invited by mail to participate in training workshops (see below). Those that said they would participate but did not respond further, and those that declined to attend, were sent a follow-up letter offering them another opportunity to participate. Three different letters of invitation were sent, depending on whether the GU was entirely within TEA 1, entirely outside TEA 1 (except list/enumerate areas), or covered by both types. The invitation announced and explained the program, urged participation, and asked for an official liaison to serve as the contact person for this program. The RCCs' partnership specialists and geographic staff emphasized to government officials the importance of LUCA at meetings devoted to programs and operations for Census 2000. The RCC staff also telephoned nonresponding GUs to find out if they had received the letter and to encourage the GUs to participate; if necessary, the RCCs sent another copy of the letter and the related information. The Census Bureau involved the State Data Centers in the program, working with them to encourage GUs in their respective states to take part and keeping them up-to-date on the progress of participating GUs.

LUCA 1998. The first GUs that could participate were those located entirely or partly within the initial blue line; i.e., they contained blocks classified as TEAs 1 and 6 at that time. (Later, some of these areas were reclassified as TEAs 7 and 8.) These were the GUs for which the Census Bureau had geocoded house-number/street-name mailing addresses in its records for some or all of their blocks. Because the addresses of these GUs were already available in the MAF, LUCA could be performed first in these areas; accordingly, the Census Bureau referred to this operation as LUCA 1998. Those GUs that did not contain TEA 1 were asked to participate in the Address List Map Review. However, GUs with fewer than 20 percent of their blocks in TEA 1 were also asked to participate and postpone LUCA participation until LUCA 1999. Of the 679 that were asked about delaying their participation until LUCA 1999, 78 declined; i.e., they preferred to review two partial files for their communities: TEA 1 blocks for LUCA 1998 and the other blocks for Supplemental LUCA (see section below).

In February 1998, the Data Preparation Division sent a letter, signed by the appropriate regional director, to the highest elected official or other appropriate person for each GU. The letter explained the LUCA program and was accompanied by related program materials. In June 1998, all nonrespondents were sent a closure letter to confirm that they would not be participating, thereby giving them one last chance to participate. Also in June, officials who agreed to take part in the program were sent a confidentiality agreement. Finally, letters were sent to all GUs that agreed to participate but had not identified a liaison and/or submitted a confidentiality agreement. GUs that did not return a response and/or an agreement to the Census Bureau could not participate.

The Census Bureau determined how many residential addresses were in its file for each GU that contained TEA 1, and it provided this information to the RCCs. RCCs could share the counts with local and tribal officials, who could use the information to get an idea of how many addresses they needed to review and how many they estimated were missing, and therefore estimate how

²⁷ See for example, Bettye Moohn, "1995 Census Test Results Memorandum No. 3, An Assessment of the Operational Effectiveness of the Local Update of Census Addresses Program Part 1—Urban Test Sites," July 7, 1995; Diane F. Barrett, "1995 Census Test Results Memorandum No. 10, An Evaluation of the Local Update of Census Addresses Program and the Master Address File—Urban Test Sites," October 24, 1995; and Bettye Moohn, "1995 Census Test Results Memorandum No. 19, An Assessment of the Operational Effectiveness of the Local Update of Census Addresses Program Part 2—Rural Test Sites," January 17, 1995 [sic, 1996].

big a project they could expect this to be for their area. This could help GUs ensure that they would be prepared to proceed with the work—that is, they would have the time, space, staff, and funds needed—once they received the Census Bureau’s materials.

The Census Bureau asked participants in LUCA 1998 to update and correct its list of addresses for their GUs; delete nonexistent addresses; verify and, if necessary, correct the census block number to which the Census Bureau had assigned an address or group of addresses; enter missing addresses on special “add pages”; annotate the TIGER-derived maps to correct errors and omissions for features and their names; identify address ranges on the maps for added features that had city-style mailing addresses; and then return the materials to the appropriate RCC. To this end, the Census Bureau sent maps that showed the legal boundary recorded for the GU in the TIGER database and the census collection block numbers for the area within and adjacent to the GU. The address list showed the residential mailing addresses, both city-style and non-city-style, that the agency had on record for each census collection block in the GU. The GUs were to annotate errors on the lists, including identifying erroneous block assignments, and to use “add pages” or electronic files to report missing residential addresses and their blocks. They were also sent a list of the number of addresses in each block; this could obviate the need for a participant to check the individual addresses if the aggregate number of addresses agreed with the counts.

The Data Preparation Division²⁸ began sending the work materials for LUCA 1998—lists of addresses by block, counts of addresses by block, and appropriate maps—to participating GUs in May 1998. Materials were still being sent to late participants and selected others in late March 1999. GUs that announced their intention to participate by the end of November 1998 were allowed up to 3 months to review the list of addresses and the maps. They were to provide their response to the appropriate RCC. The Census Bureau required the last GUs to return their materials by March 15, 1999, unless the Census Bureau itself was at fault in the timely delivery of materials, in which case a GU had to provide the results of its review by July 5. The Census Bureau conducted a field verification from late July through October 1999, so that the NPC would have all results available for keying by the beginning of November. The agency completed the MAF update in late November, and the TIGER update in late December. Participants in LUCA 1998 added 5.3 million apparently new addresses, but only a little more than 3 million (58 percent) of these were retained for the census; however, the agency estimates that all but 505,530 of these addresses would have been found by Census 2000 operations. Participants also deleted some 490,600 addresses, but the Census Bureau did not delete any address until it was confirmed not to exist or not to be residential by a field check.²⁹

LUCA 1999. This operation covered GUs that contained address listing areas (TEAs 2, 5, and 9) for which geocoded addresses and the associated maps became available in early 1999; i.e., after the agency had inserted into the MAF and the TIGER database the addresses, map spots and numbers, map corrections, and related information obtained by the address listing operation. LUCA 1999 included Puerto Rico. The Census Bureau mailed invitations to local and tribal governments from mid-September to early October 1998. The GUs had to inform the Census Bureau of their intention to participate by March 12, 1999.

For LUCA 1999, the Census Bureau provided an address list (participants were given a choice of a paper or electronic version), a count of addresses by block, and a set of maps that included the map-spotted living quarters. The agency asked the GUs to review and, if appropriate, challenge the count of addresses for each block, rather than the actual addresses. They also were asked to correct and update the Census Bureau’s maps. The agency mailed out the materials beginning in mid-January 1999. However, processing delays prevented a few address lists from going out until

²⁸ The Census Bureau changed the name of this division to the National Processing Center (NPC) in 1998.

²⁹ U.S. Census Bureau, “Census 2000 Information Memorandum No. 32, Program Master Plan: Census 2000—1998 Address List Review Program,” November 23, 1999; U.S. Census Bureau, Census 2000 Information Memorandum No. 102, Program Master Plan: Census 2000 Master Address File, May 1, 2001; U.S. Census Bureau, “Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs,” Census 2000 Informational Memorandum No. 140, July 21, 2003, pp. 1–3, 9, 11; and Karen L. Owens, “Evaluation of the Local Update of Census Addresses 98 (LUCA 98),” Census 2000 Evaluation F.3. April 16, 2003.

as late as mid-August, and mapping delays meant that a few maps were not sent until early September. The Census Bureau gave GUs 6 weeks to conduct their review, with the last submission of materials to arrive by May 12, 1999; this date slipped to early October for GUs that received their LUCA materials late. Puerto Rico was on a separate schedule, with review conducted from May 17 to July 12. Forty-eight percent of the participating GUs challenged the address counts for 117,000 blocks, although a small number of these were duplicates because of overlapping GU boundaries. The challenges affected almost 2.2 million addresses in the United States and 35,563 in Puerto Rico. Census Bureau employees—called listers—reviewed the challenged blocks, and as a result, the Census Bureau added 328,174 addresses in the United States and 9,874 in Puerto Rico; 280,503 (about 85.5 percent) and 7,525 (about 76 percent), respectively, of these were retained for the census. The listers deleted 139,540 and 2,520 addresses, respectively, that, after being field-checked, were not used for the census.³⁰

LUCA training. The RCCs scheduled workshops to explain the LUCA 1998 and 1999 programs to participants, but attendance was not mandatory. The workshops discussed concepts, the schedule, and confidentiality; trained the participants on how to read the Census Bureau's maps and use the address list and counts; and reviewed the various options for accomplishing the review and providing the required information. After being trained by RCC staff, some State Data Centers and other organizations also provided this training for local and tribal government officials. Since the procedures were different, there were different workshops for LUCA 1998 and LUCA 1999. Because LUCA 1999 covered areas where city-style addresses generally were not used for mail delivery, trainers had to show the participants how to use the Census Bureau maps that displayed map spots to identify the location of living quarters (LQs) associated with the address list and how to use the block counts to determine the need to challenge the agency's information. However, many addresses in LUCA 1999 did use city-style addresses, either for mail or for emergency services. Some GUs could participate in both LUCA 1998 and LUCA 1999 because they were split by the blue line.³¹

Participation in LUCA 1998 and LUCA 1999. All local and tribal governments located entirely or partially within the blue line were eligible to participate in LUCA 1998, while those in address listing areas were eligible to participate in LUCA 1999. GUs split by the blue line generally were eligible to participate in both. (However, some GUs were moved to the Supplemental LUCA program.) Eligibility and participation were as follows:

	LUCA98	LUCA99	Both	Total
Eligible for the program	9,241	22,043	7,536	38,820
Expressed interest in participation	8,463	8,845	2,676	19,984
Were sent maps and lists	6,241	9,023	2,378	17,642
Subsequently dropped out	224	588	10	822
Provided updates (or confirmed that no changes were needed)	5,681	4,368	1,011	11,060

The GUs participating in LUCA 1998 contained about 90 percent of the residential addresses available for review in TEA 1; for LUCA 1999, the GUs contained more than 62 percent of the HUs recorded by the Census Bureau in TEA 2. Of the 7,536 GUs eligible for both programs, 979 decided to receive materials only for LUCA 1998 and 1,144 only for LUCA 1999. More GUs were sent maps and lists for LUCA 1999 than expressed interest because, despite the alleged disinterest, they returned the confidentiality agreement that had been sent to them. Of the 2,378 GUs to which the Census Bureau did send the materials for both programs, 39 formally dropped out of

³⁰ U.S. Census Bureau, "Program Master Plan: Census 2000—1999 Address List Review Program," Informational Memorandum No. 33, November 23, 1999; U.S. Census Bureau, "Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs," Census 2000 Informational Memorandum No. 140, July 21, 2003, pp. 3–4, 9, 12–13; and Karen L. Owens, "Evaluation of the Local Update of Census Addresses 99 (LUCA 99)," Census 2000 Evaluation F.6. May 14, 2002.

³¹ U.S. Census Bureau, "Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs," Census 2000 Informational Memorandum No. 140, July 21, 2003, p. 10.

only the 1998 program and 130 dropped out of only LUCA 1999. Of course, any GU that did not formally drop out may have simply decided not to do the work—but it may have found that another agency would do the work for the GU. Because the territory of some GUs or agencies overlapped either geographically or jurisdictionally, the coverage for GU participation was understated because a subsequent survey (see below) revealed that the addresses for 28 percent of nonparticipants were reviewed by a GU that did participate; similarly, 21 percent of participants that did not provide updates said their information was provided by another GU. Another 30 percent did not reply because they claimed they had no changes to report.³²

Supplemental LUCA. The Census Bureau discovered a number of problems regarding the LUCA program. For 679 GUs mentioned above, the Census Bureau's address records had significantly fewer addresses in TEA 1 areas than the number of HUs tabulated in the 1990 census or the agency's 1996 estimates for the same areas. Most affected GUs agreed to a single review of all addresses in LUCA 1999. However, in November 1998, the Census Bureau decided to delay participation of most of these GUs in LUCA until the agency could improve its address list via the block canvassing operation; the Geography Division had flagged the TEA 1 blocks to identify them for inclusion in LUCA 1999. The Census Bureau placed the appropriate blocks for these GUs into a separate operation called the Supplemental LUCA 1998 program.

In addition, for 100 GUs in TEA 1 that were at the edge of or split by the blue line, the RCC's geographic staff reviewed the address file for each GU, and recoded all (for 39 GUs), some, or none of the blocks from TEA 1 to TEA 9, thereby placing the recoded blocks outside the blue line. As a result, instead of the addresses in these blocks being verified and updated via block canvassing, the Census Bureau implemented a previously unscheduled fourth wave of address listing. The recoding also changed the Census 2000 enumeration of these blocks from the MO/MB methodology to U/L. The GUs were reassigned to Supplemental LUCA so that they could review the housing counts after completion of Wave 4 of address listing.

The Census Bureau determined that several other GUs had not been given the opportunity to participate in LUCA, while others had already signed up, but were found to have address or block numbering problems. For them to participate in the LUCA program, they had to be included in Supplemental LUCA. These GUs included parts of each of the dress rehearsal sites, a county that had recently established city-style addresses, a jurisdiction whose agreement to participate in LUCA was delayed in the mail for 8 months, 89 newly established GUs, 686 GUs containing blocks that the Census Bureau had missed for either LUCA 98 or LUCA 99, and eight Indian tribes that shared a reservation with another tribe but had not been invited to participate in the original program.

As a result, Supplemental LUCA 1998 included not only areas that were originally in LUCA 1998, but areas that should have been involved in LUCA 1999. Accordingly, this operation followed the same procedures as LUCA 1998 and/or LUCA 1999, depending on whether an address list was improved via block canvassing or created by address listing.

From early June through mid-September 1999, the Census Bureau sent letters inviting most of the affected GUs to participate in this program. A few GUs were dealt with separately when the agency discovered a specific problem. The lateness in implementing Supplemental LUCA 1998 left the Census Bureau no time to conduct separate workshops for this operation; instead, the mailout included a separate explanation of this phase of LUCA as a supplement to the LUCA 1998 and LUCA 1999 technical guides. The last addresses from Supplemental LUCA were inserted into the MAF at the end of June 1999. As a result, the Census Bureau did not ship the necessary materials to the participants until late August through early October 1999. Most GUs were allowed 6 weeks to review, annotate, and return the materials to the appropriate RCC—i.e., by the end of November 1999—but by special agreement, the South Carolina dress rehearsal entities were allowed 3 months, until early January 2000. A total of 2,015 GUs—1,813 of them entirely or significantly in

³² Karen L. Owens, "Evaluation of the Local Update of Census Addresses 98 (LUCA 98)," Census 2000 Evaluation F.3., April 16, 2003, and Karen L. Owens, "Evaluation of the Local Update of Census Addresses 99 (LUCA 99)," Census 2000 Evaluation F.6. May 14, 2002.

block canvassing areas—were included in Supplemental LUCA 1998. Field verification for the challenged blocks in these GUs took place from October 20 to late January 2000.³³

The LUCA operation. The Census Bureau provided each participating GU with:

- A list (either a paper printout or a computer-readable file on compact disc, floppy disk, or computer tape) of the addresses recorded in the MAF for each block in a GU.
- Tallies of those addresses by both Census 2000 collection block number and 1990 census tabulation block number.
- A set of maps that showed the collection blocks and the most current legal boundary recorded in the TIGER database for the GU.
- A listing that showed on which map sheet(s) each collection block appeared.
- A technical guide that contained instructions on performing the LUCA review.

The address lists used two types of forms, depending on whether or not the GU was a tribal government; one displayed the high-level geographic information related to the Census Bureau's standard geographic entities (county, county subdivision, incorporated place), while the other displayed tribal-related information. For the dress rehearsal LUCA, all addresses—city-style and non-city-style—were intermingled on a single list. The Census 2000 operation used two different types of pages for city-style addresses and non-city-style addresses, because the Census Bureau found that dress rehearsal LUCA participants were confused by the mixture of address types on a single list and the separate method of responding to each type. The GUs in LUCA 1998 and Supplemental LUCA 1998 also received a set of add pages on which to record missing addresses. GUs that chose to receive their address information electronically did not receive the add pages because they could report missing addresses via the electronic file.

For LUCA 1998, when GUs returned updated and corrected address and map information, the RCCs verified the information against what its field staff reported during the block canvassing operation.

The Census Bureau originally planned to update the MAF with the updates from LUCA, and then have all the addresses checked during the block canvassing operation; however, only some of the updates were incorporated into the MAF before block canvassing had to proceed. Beginning in April 1999, the RCC staff performed a second on-the-ground check of all disputed addresses in selected blocks, called the LUCA Field Verification operation.³⁴ The Census Bureau also planned to undertake a reconciliation process for LUCA 1998, in which an RCC would contact a GU in an attempt to resolve some or all of the disputed addresses, but it dropped the idea because of problems in coordinating the logistics of such an operation in the limited time available. The list of addresses covered by the verification operation included all the addresses recorded in the MAF for the block, including those added by the GU, but these (and any other changes the GU made) were flagged for special attention by the field staff ("listers"). The field verification operation also checked residential addresses deleted during the block canvassing operation to ensure that they really should not appear in the MAF; these addresses were flagged for special attention on the listers' address lists. Originally, the Census Bureau was going to perform field verification for a sample of the disputed addresses, but it dropped this idea after determining that the results would neither validate nor invalidate the unsampled addresses. If the agency decided to recanvass blocks in a GU, the RCC was instructed to complete this work within 30 days. Field verification began at the end of July 1999 and was completed by the end of October. All information found by this operation was added to the MAF³⁵ and the TIGER database, as appropriate, by the National Processing Center (NPC). The Census Bureau retained all disputed addresses in the MAF with a flag and did not actually delete them unless and until confirmed with a site visit by field staff.

³³ Karen L. Owens, "Evaluation of the Local Update of Census Addresses 98 (LUCA 98)," Census 2000 Evaluation F.3., April 16, 2003, pp. 4–5 and U.S. Census Bureau, "Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs," Census 2000 Informational Memorandum No. 140, July 21, 2003, pp. 2–3.

³⁴ *Federal Register*, Vol. 63, No. 12 (January 20, 1998), p. 2950.

³⁵ The Census Bureau did not key each new address or address revision directly into the MAF. Instead, staff (usually at the NPC) used a specified format to key new addresses and revisions into a file, which the agency's Decennial Systems and Contract Management Office (DSCMO) converted into a master address file update file

The Census Bureau then provided each GU with a written detailed feedback/final determination of its findings, which the agency tried to produce within 30 days. The Census Bureau sent the final determination materials to participating GUs from the end of October 1999 through the end of February 2000. For collection blocks in TEAs 1, 6, 7, and 8, these materials included the final address list, a summary of the number of address updates accepted and not accepted, the number of residential addresses in each block before and after the LUCA process, a “transaction report” listing all address updates submitted by the participant and their disposition by the Census Bureau, and a map of the GU showing all census features and collection block numbers recorded in the TIGER database; the maps did not show map spots.³⁶

For LUCA 1999, the Census Bureau also planned to do reconciliation/field verification, which would entail a complete recanvass of blocks that participants identified as having an incorrect count of residential addresses. As for LUCA 1998, the Census Bureau planned a reconciliation process that would try to resolve disputed counts by reviewing problem addresses with GUs, but as noted above, time did not permit carrying it out. For field verification, each block served as a separate assignment area for a lister. For each unresolved disputed block, a lister was given a list of the information recorded for each housing unit during address listing with a computer-produced copy of the map-spotted block map. The listers visited each assignment area—i.e., block—where they checked, by interview and observation, the information for each housing unit they found against the information recorded in an address register and on a census block map. They recorded corrections and omissions both in the register and on the map, as appropriate. The Census Bureau planned to complete this operation within 21 days. All information found by this operation was added to the MAF and the TIGER database, as appropriate, by the NPC. Within 30 days, the agency provided detailed feedback/final determination information for the disputed blocks to the GUs that had challenged the counts, together with a new set of maps. However, GUs that returned the LUCA materials late did not receive this information, and the Census Bureau did not perform field verification for those areas. Field verification began in early May 1999, with the bulk of the cases completed by June 19 and the remainder by the end of August; for Puerto Rico, the recanvass was performed during August 18 to 30. The Census Bureau sent the final determination materials to participating GUs from the end of September 1999 through late February 2000.³⁷

As the LUCA operation was winding down, the Geography Division held a debriefing on November 4, 1999, of geographers from six RCCs. There was general agreement on a number of major problems:

- The Census Bureau provided insufficient support of the LUCA program, the RCCs did not have enough knowledgeable people, and too many areas at headquarters were involved.
- The Census Bureau relied too heavily on local/tribal governments’ ability to use electronic files.
- The RCCs needed to have more freedom to control the operation for their area, including modifying the training materials to reflect situations in their areas.
- The control system did not work well, primarily because it was too inflexible, resulting in some RCCs maintaining a shadow control file that they felt better served their needs.
- Having some GUs deal with two types of LUCA programs created operational problems.

(MAFUF) that stored the information until all the addresses for a job had been entered. When the Geography Division was ready to merge the completed file into the MAF, the DSCMO transferred the appropriate MAFUF(s) to the Geography Division to enter via a batch process. Each time a job started with a fresh file, a new MAFUF was created. The Geography Division could merge one, several, or many such files at one time.

³⁶ *Federal Register*, Vol. 64, No. 125 (June 30, 1999), pp. 35550–51; U.S. Census Bureau, “Census 2000 Informational Memorandum No. 32, Program Master Plan: Census 2000—1998 Address List Review Program,” November 23, 1999; U.S. Census Bureau, “Census 2000 Informational Memorandum No. 102, Program Master Plan: Census 2000 Master Address File,” May 1, 2001; U.S. Census Bureau, “Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs,” Census 2000 Informational Memorandum No. 140, July 21, 2003, pp. 1–3, 9, 11; and Karen L. Owens, “Evaluation of the Local Update of Census Addresses 98 (LUCA 98),” Census 2000 Evaluation F.3., April 16, 2003.

³⁷ *Federal Register*, Vol. 64, No. 125 (June 30, 1999), pp. 35551–53.

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- Changes in the program and delays in delivery of materials caused problems for both the RCCs and the GUs and strained relations with some of them.

The Census Bureau did not conduct LUCA for blocks slated for the list/enumerate procedure. LUCA was a precensus activity, and in list/enumerate areas, the addresses and counts were not available for review until the enumeration was completed and all the enumerator updates and addresses were entered into the TIGER database and the MAF. Thus, approximately 282,000 collection blocks in all or part of 1,215 GUs in 187 counties and statistically equivalent entities in 19 states were not subject to review via the LUCA process. Instead, the Census Bureau initiated a number of quality assurance checks to ensure that enumerators did not miss any housing units in list/enumerate areas, use the wrong type of questionnaire, identify occupied housing units as vacant, etc.; these are discussed later in this chapter. In the remote areas of Alaska, the team leader responsible for the enumeration—who occasionally served as the enumerator—asked the leader(s) of the village or community, after being sworn to uphold census confidentiality, to check the list of HUs and group quarters after the team leader felt that the enumeration was complete. This served, in effect, as a special approach to an address list review.³⁸

The LUCA appeals process. If a GU disagreed with the content of the final list of addresses or address counts, the GU had the right to attempt to prove that the addresses and/or streets existed by challenging the Census Bureau's decisions through an appeals process. The Census Address List Appeals Office, an independent, temporary federal office not affiliated with the Department of Commerce, reviewed the appeals. This office was established by the administrator of the Office of Information and Regulatory Affairs (OIRA, part of the federal government's Office of Management and Budget [OMB]) in consultation with both appropriate Census Bureau staff and the chief statistician of the OMB. The OMB published the appeals process (and, indeed, the entire LUCA process) in the *Federal Register* on June 30, 1999.³⁹ A GU had to file its appeal within 30 calendar days after the Census Bureau sent the address list and maps for detailed feedback/final determination. To assist in the review of 1998-style challenges, the Census Bureau provided the Appeals Office with CD-ROM files on a flow (weekly) basis of the same detailed feedback lists and detailed feedback processing reports that it provided to participants. The Appeals Office received the first challenges on October 7, 1999. It planned to resolve all appeals of LUCA 1999 materials by January 14, 2000, so that any addresses it added could be used for the U/L operation, and LUCA 1998 materials before Census Day. However, because of the late shipment and local review of the materials for many GUs, the latter date for resolution slipped to late April 2000. The last appealed addresses were added to the MAF in June. The late addresses were either mailed a questionnaire if they were processed before Census Day (April 1, 2000) or field-checked and, if appropriate, enumerated during the coverage improvement follow-up operation (see below).

For LUCA 1998, a total of 697 participants appealed, but 52 of these appealed after the deadline and were denied as untimely. Thus, the Appeals Office processed 645 LUCA 98 appeal cases. GUs challenged a total of 322,914 addresses, of which the Appeals Office accepted 302,507. For LUCA 1999, 700 participants appealed, of which 80 appealed late and were denied as untimely. For the 620 LUCA 1999 cases that were processed, the Appeals Office reviewed a total of 23,465 addresses and accepted 19,529. These figures include 46 GUs that challenged the Census Bureau's records for both LUCA 1998 and LUCA 1999. As a result of the appeals process, the Census Bureau was directed to add, and attempt to enumerate, 322,036 residential addresses that met its standards for inclusion in the MAF. The GEO was unable to geocode 1,644 addresses despite the best efforts of the Master Address File Geocoding Office Resolution and Targeted Map Update operations; although these addresses could not be submitted for enumeration, GEO stored them in the MAF with a special flag. GEO inserted into the TIGER database all addresses that appellants showed with a map spot, both inside and outside the blue line; the few that were inside the blue

³⁸ U.S. Census Bureau, "Program Master Plan: Census 2000—1999 Address List Review Program," Informational Memorandum No. 33, November 23, 1999; U.S. Census Bureau, "Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs;" Census 2000 Informational Memorandum No. 140, July 21, 2003, pp. 3–4, 9, 12–13. Karen L. Owens, "Evaluation of the Local Update of Census Addresses 99 (LUCA 99)," Census 2000 Evaluation F.6. May 14, 2002.

³⁹ *Federal Register*, Vol. 64, No. 125, pp. 35547–58.

line represented non-city-style mailing addresses. Census 2000 field operations found that 141,580, or just over 44 percent, of the 320,392 geocodable addresses qualified as housing units for inclusion in the census.

Survey of participation in LUCA. In order to improve the effectiveness of the LUCA program for future operations, the Census Bureau contracted with Anteon Corporation to conduct a survey of a sample of 3,265 local and tribal governments that were eligible to participate in the 1998, 1999, and Supplemental LUCA programs. From February to March 2001, Anteon tested its survey form on two GUs in each of the following categories: nonparticipants (2,045 GUs in the survey), participants that did not provide updates (820), and participants that provided updates (400). A nonparticipating GU was defined as one that did not receive an address list and/or map because it did not sign a confidentiality agreement or dropped out of the program before the materials were sent. A disproportionately higher portion of the sample was directed toward nonparticipants and nonrespondents because of the importance of finding out how the Census Bureau might encourage them to participate in or respond to a future LUCA.

Beginning on April 9, 2001, the NPC sent letters notifying the highest-elected officials (but not the LUCA contact persons) that their local or tribal governments had been selected to participate in the survey; the following week, the NPC mailed the survey forms, together with a cover letter signed by the Director of the Census Bureau, that were tailored to each of the three categories; and 1 week after that, sent thank-you/reminder postcards. The agency asked the GUs to respond within 2 weeks of receipt of the materials. During the week of April 30, the NPC sent a follow-up cover letter and another copy of the appropriate questionnaire to GUs that had not responded; this letter again requested a response within 2 weeks. The various correspondence provided a toll-free number for assistance. Anteon received 1,398 responses—42.8 percent of the GUs contacted—by its final deadline of June 22. Responses were received from 226 (56.5 percent) of the surveyed GUs that provided updates, 349 (42.6 percent) that did not provide an update, and 823 (40.2 percent) of nonparticipants. Anteon did not tabulate an additional 85 survey forms received in the 10 weeks after that date—which increased the response rate to 45.4 percent—but provided the GEO with a summary of the information contained in those responses.

Those that did participate in LUCA indicated the main reason why was that their area had experienced significant changes in the housing inventory—one can infer that they wanted to be sure that the Census Bureau was aware of all their new residential addresses—and they had a readily available source of addresses. Nonparticipants and nonrespondents noted that the main drawbacks to participating or responding were lack of funds and/or personnel and the volume of work, including insufficient lead time to obtain the necessary funds and staff and to assemble the information—and then actually doing the work. Some did not have a readily available source of address information for their area, while others had concerns with signing the confidentiality agreement and/or ensuring the security of the information. A total of 53 GUs—21.4 percent of nonparticipants that responded—reported that another level of government covered their area in its participation; thus, one can surmise that the addresses for a substantial number of GUs were reviewed for LUCA even though they themselves did not participate directly. Many of the smaller GUs reported that there was no change in their housing inventory. Despite the several mailings and follow-up related to LUCA, 60 percent of nonparticipants did not recall being invited or contacted about the program. Overall, 66 percent of the respondents that remembered the program indicated overall satisfaction with it—regardless of whether or not they had participated—and 78 percent said they would be interested in participating in future LUCA-type programs; for those that actually had provided updates, the corresponding numbers were much higher: 86 and 94 percent, respectively.⁴⁰

LUCA special place program. Special places were not covered by the regular LUCA program. In mid-November 1999, the NPC sent an invitation letter to 18,458 GUs that had previously provided a confidentiality agreement for the LUCA program (regardless of whether they actually performed

⁴⁰ Karen L. Owens, "Evaluation of the Local Update of Census Addresses 98 (LUCA 98)," Census 2000 Evaluation F.3. April 16, 2003, pp. 14–26; Karen L. Owens, "Evaluation of the Local Update of Census Addresses 99 (LUCA 99)," Census 2000 Evaluation F.6. May 14, 2002, pp. 13–17.

the review). For five GUs for which the Census Bureau did not have the name of an official to contact, the appropriate RCCs sent the invitation separately by November 29. The purpose of this program was to verify that the Census Bureau's records accurately included all special places in each GU, thus ensuring that the residents of these facilities would be enumerated for Census 2000. The review applied only to special places, not to the individual facilities—dormitories, wards, etc.—that constitute group housing within a special place. The Census Bureau asked the GUs to respond to the invitation by December 3 (December 6 for municipios in Puerto Rico, and December 15 for the five GUs invited by the RCCs) if they wanted to participate in this program.

A total of 3,731 GUs offered to participate in the program; of these, 32 had not participated in the regular LUCA Program. The Census Bureau, from mid-December 1999 through early January 2000, sent these GUs a list of the names, addresses, physical/location descriptions (if appropriate), collection block numbers, and related information for the special places known to exist within their boundaries. The Census Bureau provided the list only as a paper product; an electronic file was not an option. GEO created this list by integrating into the MAF the special places in the DSCMO's November 1999 special place control file. The Census Bureau also provided a block-numbered map if a GU had not retained the map it used for the LUCA program or if it had not returned materials and therefore did not receive the latest version of the agency's map of the area for detailed feedback/final determination. These maps did not include map spots. Both the address lists and the maps were printed and mailed by the NPC.

GEO prepared a technical guide that explained how the GUs were to perform the work. As with LUCA, a participant was to identify errors and omissions. A GU had 4 weeks from the date of receipt of the list and map to review and return the materials to its RCC—i.e., late January to early February 2000. For a few GUs, the Census Bureau extended the deadline to as late as April 26, and RCCs accepted submitted materials through May 5. A total of 1,960 GUs returned address lists and/or add pages to the RCCs.

The Census Bureau did not conduct a detailed feedback/final determination operation for, nor did the appeals process apply to, the LUCA special place program. Instead, the RCCs passed the changes on to the LCOs for review and, if appropriate and timely, inclusion during the local knowledge update operation.⁴¹

New Construction program. In April 1999, the Census Bureau decided to implement a program that would supply information about housing that was constructed in MO/MB areas between the time of the LUCA program and Census Day. (This procedure was not necessary in other areas because the agency's field staff visited the HUs in areas on or about Census Day and updated the address list.) The Census Bureau initiated this program to help allay fears expressed by local and tribal governments that the census would miss new HUs in these areas where, except for input from the late delivery sequence files (DSFs), the address list used for the mailout had not been updated since the block canvassing and LUCA operations.⁴²

In mid-October 1999, the RCCs sent letters inviting the 18,690 GUs that were eligible to participate in LUCA 1998—that is, those that contained blocks whose HUs predominantly used city-style mailing addresses (TEAs 1, 6, 7, and 8)—to provide mailing addresses for HUs that were newly built or expected to be completed for occupancy by Census Day. Thus, this program offered a final opportunity for GUs to help update the Census 2000 address list. It also provided a second chance for participation by those GUs that did not take part in LUCA 1998. The Census Bureau did exclude one type of geographic entity that it had permitted to participate in LUCA 1998: Oklahoma tribal statistical areas. These did not have a legally defined land base, and the associated tribes should not have been included in the earlier program.

⁴¹ U.S. Census Bureau, "Program Master Plan: Census 2000 Local Update of Census Addresses Special Place Program," Census 2000 Informational Memorandum No. 69, August 28, 2000; U.S. Census Bureau, "Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Programs," Census 2000 Informational Memorandum No. 140, July 21, 2003, pp. 4–5.

⁴² The New Construction program laid the groundwork for the Census Bureau's Community Address Updating System, a program that will help update the MAF in preparation for the 2010 Census.

As in LUCA, each GU that chose to participate had to complete and submit a confidentiality agreement (even if the GU had done so previously) before the Census Bureau would send a copy of its map of the GU and the related list of addresses. The GUs originally had until November 1, 1999, to respond, but because of the importance of this program, the Census Bureau sent a follow-up closeout invitation letter to all nonresponding GUs during the first half of November. The letters set November 24 as the final date for GUs to inform the Census Bureau of their intention to participate. However, the RCCs accepted confidentiality agreements if they were actually in hand by December 3 (matching the final date for accepting participation in the LUCA Special Place program). A total of 5,877 GUs agreed to participate; 2 others returned confidentiality agreements, but then withdrew from the program. Of these, 833 had not participated in the LUCA program. (A few of these did not have the opportunity to participate because they came into existence after that program was underway.)

The participants had the choice of receiving the list of addresses on paper or electronically; 2,810 (48 percent) chose to receive paper. Separate lists reported the number of HUs in each census block and provided a block-to-map relationship. A new set of maps was provided to each participant, together with a new block-to-map relationship list. The NPC prepared and shipped all materials, including a training guide. Unlike with the LUCA program, the Census Bureau did not offer workshops to help the GUs understand this program, because time did not permit such an effort.

The GUs were asked to update the maps for missing streets and to provide any new (or missing) residential city-style mailing addresses, together with their census collection block numbers, on a specific form or in a computer-readable format. The Census Bureau began producing the outgoing materials on December 16, 1999, which was the effective date for the GUs included and the legal boundaries used. The NPC sent materials for the New Construction program from mid-January through mid-February 2000—generally, after the GEO had input the latest information from the November 1999 DSF into the MAF—with replacements and missing materials provided by late March. Between February 14 and 25, the Census Bureau sent a reminder letter about the program and deadline. To this end, GEO provided a list of participants' fax numbers to the agency's Technologies Management Office, which used its automated fax capability to distribute the letter to participants. The RCCs mailed the letter to participants for which GEO did not have a usable fax number. The Census Bureau sent the letter to 7,434 highest- elected officials and/or program liaisons, of which 7,055 (95 percent) were faxed successfully. The first reply was received 10 days after the mailout, although the participants could submit their information postmarked no later than April 3, 2000; 2,857 GUs actually did so. The GEO tracked participation in this program via the geographic program participant database (see Glossary). As with LUCA, long after the operation was over, the Census Bureau determined the need to remind the liaisons of their responsibility to return or destroy the address lists and map-spotted maps.

Six GUs decided to submit information for the New Construction program even though they had not provided confidentiality agreements, nor had the Census Bureau provided them with new maps and address listings. The agency accepted the addresses that met the requirements of the program.

Several GUs did not show block numbers that would identify the location of some or all of the addresses they provided. The Census Bureau attempted to geocode these addresses automatically. For approximately 8,000 addresses that the computer could not geocode for 22 participating GUs, the RCCs attempted to do so by using in-house reference sources (i.e., a Master Address File Geocoding Office Resolution [MAFGOR]-type operation), requesting information from the GUs and other local contacts, and, if necessary, undertaking field checks. Often, this required adding new streets and/or address ranges to the TIGER database. This operation was completed on April 28, 2000, and the RCCs completed posting the information to a master address file update file (MAFUF) on May 5. Despite the RCCs efforts, the agency could not geocode 812 addresses in 14 of the GUs. The Census Bureau did not include the uncoded addresses in any Census 2000 follow-up operation because they could not be assigned to specific geographic areas for field work, and the RCCs had already tried and failed to find them. It is likely that these addresses did not exist, and included housing that had not yet been constructed but for which a GU had an address in its records.

The RCCs entered the map changes into the TIGER database by May 26 and the addresses into a MAFUF by May 31. GEO then unduplicated and merged the new addresses into the MAF, and geo-coded them for inclusion in the decennial master address file (DMAF). All files were processed or reprocessed successfully by June 2. The Census Bureau kept the valid added addresses obtained by this program separate, to be visited by enumerators after the census was under way (as part of the coverage improvement follow-up [CIFU] operation). The goal was to ensure that an HU really did exist at each added address on Census Day and to enumerate it at that time if it qualified for inclusion. This was not a LUCA program, and thus was not subject to challenges through the OMB's Census Address List Appeals Office. Because all New Construction addresses were subject to a field check during the CIFU operation, permitting challenges would serve no purpose—nor would there have been time for a challenge to be reviewed and acted on. The Census Bureau estimated that this operation would add some 350,000 address records to the census, but it actually added 371,812 acceptable addresses; however, the CIFU operation deleted 196,792 (53 percent) of these, leaving 175,020 as apparently valid adds from the New Construction program.⁴³

Confirmation of destruction of Title 13 materials. Long after the LUCA and New Construction programs were over, the Census Bureau decided it had to be sure that the confidential materials—address lists and map-spotted maps—provided to each of the 18,905 local and tribal governments for these programs had indeed been destroyed or returned to the appropriate RCC. The technical guide for each program contained a destruction form that a participant was to return when the work had been completed; alternatively, the participant was asked to return the maps and address list. To remind the participants of this requirement, and to ensure that they had followed through, the Census Bureau faxed a reminder letter, signed by the appropriate regional director, and a destruction form to the program liaison for GUs for which the agency did not have a record of having received either a destruction form or the materials for each program. If appropriate, a different reminder letter, without the form, was sent to the highest elected official of a participating GU. GEO provided the Census Bureau's Technologies Management Office (TMO), which had automated fax capability, with a list of fax numbers for specific participants. The TMO faxed the letters and forms in five waves from late July through mid-September 2000. The inclusion of a GU in a specific wave was based on the LUCA program(s) it had participated in and whether it had participated in the LUCA Special Place and New Construction programs, as follows (the second day was used to re-fax to addresses that failed the first day's transmission):

- Wave 1: July 24-25, to 2,356 GUs that had received these materials for the LUCA 1999 program
- Wave 2: August 10-11, to 6,666 GUs that had received these materials for the LUCA 1999 program or the LUCA Special Place program
- Wave 3: August 24-25, to 7,139 GUs that had received these materials for the LUCA 1998 program
- Wave 4: August 28-29, to 6,835 GUs that had received these materials for the LUCA 1998 program or the New Construction program
- Wave 5: September 11-12, to 6,808 GUs that had received these materials for the New Construction Program⁴⁴

For this program, the Census Bureau sent 29,804 faxes to program liaisons and elected officials in 14,903 GUs. For those GUs for which the Geography Division did not have a fax number (approximately 4,040 GUs) or the fax number failed (approximately 1,800 GUs), the NPC mailed the appropriate materials. The mailings took place in two shipments, one on August 17-18 and the second on September 18-19. The letter reminded the program liaisons and highest elected officials that, if

⁴³ *Federal Register*, Vol. 64, No. 125 (June 30, 1999), p. 35551; U.S. Census Bureau, "Program Master Plan: Census 2000 New Construction Program," Census 2000 Informational Memorandum No. 68, August 4, 2000; U.S. Census Bureau, "Assessment Report: Census 2000—1998, 1999, and Special Place Local Update of Census Addresses and New Construction Program," Census 2000 Informational Memorandum No. 140, July 21, 2003, pp. 5–6.

⁴⁴ Supplementary LUCA participants were included with the LUCA program that applied to their type of address area: LUCA 1998 or LUCA 1999.

they had not already done so, they MUST at this time destroy the materials or return them to the appropriate RCC. It asked the liaisons to confirm that the appropriate action had taken place by certifying this information on the destruction form and mailing the completed form to the NPC or faxing it to a toll-free number in the TMO. If a GU preferred, it could send the materials to the RCCs at this time. A GU received only one fax or mailout, with a destruction form that listed each program—LUCA 1998, LUCA 1999, Supplemental LUCA, Special Place LUCA, and/or New Construction—for which the GU had received the appropriate materials, but for which GEO did not have a record of either destruction or return of these materials. If a GU had submitted a form or the materials for only one program, but had participated in others, the GU's response was incomplete. The GU then received a fax/mailout that identified the offending program.

The NPC faxed a copy of each form it received in the mail to the TMO. The TMO forwarded the faxed responses to the Statistical Research Division, which processed them into the Census 2000 control system before transmitting them to the GEO. The NPC sent the forms to the GEO, which checked its records and then passed them on to the FLD for aggregation and forwarding to the appropriate RCCs for their files. The RCCs recorded the dates on which participants returned forms or materials in a LUCA/NC Destruction Forms Returns Production Control System.

For 6,621 GUs, GEO did not have a response form by September 21 for all the programs in which the GUs participated. GEO and the TMO followed up with those GUs on September 25-26 with a sixth wave of faxing. These GUs required 12,072 faxes to 6,095 liaisons and 5,977 elected officials; these did not include 526 liaisons and 644 officials for which the Census Bureau did not have a valid fax number, and so although the liaison in a GU got the materials, the official might not have, or vice versa. As in the previous faxes and mailings, the liaisons received a letter and the destruction form, while the officials received only a letter. The letter did not specify that September 21 was a deadline; the Census Bureau applied this cutoff date based on when (September 22) the GEO had to provide the TMO with the file of addressees for the Wave 6 faxes.

From October 13 to 16, the NPC printed and shipped to the RCCs a new set of destruction forms for the 6,463 GUs for which the GEO still did not have response records. Beginning on October 16, the RCCs telephoned and/or visited either the program liaison or, if appropriate, the highest-elected official. GEO asked the RCCs to try to complete all phone calls by November 24, and RCCs in turn informed the nonresponding participants that they must return the completed forms or the Title 13 materials no later than December 8. This follow-up operation included those GUs that had not responded to a mailout—that is, GUs that the Census Bureau could not contact via fax—and therefore were not included in Wave 6. It also included GUs for which the NPC received 920 destruction forms. NPC faxed the forms to the TMO. Unfortunately, the TMO did not receive them, but meanwhile the NPC had inadvertently destroyed the forms before they could be re-sent. Therefore, if a GU told the RCC caller that it had sent in a signed form to the NPC, the RCC checked to be sure that the GU was in the first mailout. If so, the RCC recorded this response as fulfilling the requirement even though the Census Bureau did not have a completed form in hand; if not, the RCC requested that the GU submit another copy of the signed destruction form. Also, if the liaison or elected official was no longer with the GU, and the new contact person knew nothing about the program, that person, after checking with appropriate staff and records, could complete the destruction form statement by rewording it to say that (s)he was not aware of any Title 13 materials being on site. The RCCs were asked to complete a Telephone Follow-up Record for each contact with a participant and to send a copy of all of these forms to GEO at the end of the operation. RCCs also entered updated information about dates and contacts in the geographic program participant database on a flow basis and were instructed to record dates of return of forms or materials in the control system by December 15. The Census Bureau emphasized that name information in the program participant database for the highest-elected official of each nonrespondent GU had to be as complete and accurate as possible by that date.

In March 2002, the Census Bureau still did not have a record of either a completed destruction form or the required materials for 169 GUs and had received only a partial response from 4 others. After some consideration, the Census Bureau decided to have the regional offices (ROs) contact the nonresponding participants to determine what they had done with the materials; the RO staff accepted verbal “get it in writing.” Through January 2003, only 16 GUs remained unresolved.

Any GU that still had not destroyed or returned its Census 2000 materials—or satisfied the Census Bureau that it had done so—was to be offered only limited participation in the LUCA program for Census 2010; for example, such a GU might be permitted to see only housing unit counts by block and be allowed to review the address list and map-spotted maps for its area only in the presence of agency staff.

Administrative records. For previous censuses, the Census Bureau had considered using administrative records from sources such as the Internal Revenue Service, Social Security Administration, and welfare programs to identify addresses that could be used to supplement its address list. Using these records was considered again for Census 2000, but the same problems resurfaced, such as addresses that were not appropriately formatted, might not represent the location of the associated HUs, could not be limited to MO/MB areas, might not be current, etc. As a result, the Census Bureau was not able to work these records into the MAF. Instead, the agency considered using this information for postcensus evaluation of and improvements to the current address list in preparation for the 2010 Census.

Postal validation check (PVC). In February 1998, the Census Bureau worked with the U.S. Postal Service (USPS) to have local letter carriers update the agency's list of addresses for the Sacramento, CA, and MO/MB portion of the Columbia, SC, dress rehearsal sites. For ZIP Codes identified as being entirely within the blue line, the carriers checked the address, based on the MAF, on each preprinted address card the Census Bureau provided against the cases used to sort incoming mail for delivery—the same type of casing check used for the previous three censuses. (The USPS refers to this operation as its Address Sequencing Services.) This operation added 4,833 addresses to the MAF. It also identified many addresses for deletion; the Census Bureau retained that information for validation during the redelivery of undeliverable questionnaires and nonresponse follow-up operations (see the pertinent sections in this chapter). The operation also identified many duplicate addresses, which had to be unduplicated.

For Census 2000, the Census Bureau recommended that the USPS perform this casing check in late December 1999 or mid-January 2000 for those ZIP Codes that were entirely or substantially within the blue line, and therefore predominantly made up of city-style addresses—i.e., TEAs 1, 6, and 7. However, the casing check was not implemented for Census 2000 because the USPS strongly warned that it would be a very labor-intensive—hence, very expensive—operation, the results of which could be more efficiently obtained simply by continuing to rely on updates from the DSF. Instead, the Census Bureau used a file of DSF adds for the period November 1, 1999, through January 14, 2000, to supplement the MAF derived from the November 1999 version. This transaction file, which GEO received in February 2000, included the results of the January 2000 National Edit Book Week, which, in lieu of performing an actual casing check in January 2000, the USPS had strongly encouraged its post offices to make as complete and current as possible (see the “Origin of the Census 2000 Address File” of this section). The Census Bureau obtained subsequent updates to the address list from various other operations discussed below, as well as from incorporating the changes included in the April 2000 version of the DSF.

For the 1970 and 1980 censuses, when the letter carriers delivered the census questionnaires, they completed cards that informed the Census Bureau about missing residential addresses. After discussions both internally and with the USPS, the notion of a time-of-delivery check was rejected because of the difficulty in defining the area to which letter carriers had to restrict their coverage (TEA 1, the area in which the USPS delivered questionnaires) and the lateness of trying to add and geocode addresses obtained by such an operation. The agencies agreed that the steps taken by the USPS to enhance the DSF canceled the need.⁴⁵

⁴⁵ *Federal Register*, Vol. 64, No. 125 (June 30, 1999), p. 35551; U.S. Census Bureau, “The Census Bureau’s Master Address File (MAF): Census 2000 Address List Basics,” March 1999, p. 12.

CRADA to improve the address list. In order to improve the viability of the MAF, the Census Bureau undertook a cooperative research and development agreement (CRADA) in mid-March 1998 with First Data Solutions, Inc., to serve as a possible source of additional addresses.⁴⁶ The goal of the agreement was to determine methods of improving the inventory of residential addresses (especially addresses not in the USPS files), investigating automated techniques to identify duplicate residential addresses, using information routinely from the USPS' files, linking addresses to Census 2000 geographic entities, and developing systematic approaches to the general maintenance of the MAF. However, the primary goal was to have as many current residential addresses in the MAF as possible prior to the New Construction program in order to minimize the number of last-minute additions (many of which would require manual geocoding) from that operation. In fall 1998, First Data Solutions provided, for the Census Bureau's evaluation, an address file that it anticipated would supplement the city-style mailing addresses in the DSF for three counties. Each county actually had three files, one for each of three sets of addresses based on First Data Solutions' classification of their reliability. GEO staff checked the addresses in the field, which led the company to improve its presentation of the addresses and confirmed the quality of the classification system. In mid-May 1999, First Data Solutions (subsequently renamed Donnelley Marketing) provided 105 address files, 3 for each of 35 counties. The Census Bureau planned to evaluate the addresses based on the results of block canvassing, address listing (for city-style mailing addresses), and information from various administrative records. It also considered a separate evaluation of non-city-style addresses in address listing areas. The constraints of time and programming resources obviated the Census Bureau's ability to perform these evaluations. Instead, the agency decided to defer following through with such a CRADA until it undertakes evaluation of and possible improvements for the 2010 Census address list.

Master Address File Quality Improvement Program (MAF QIP). The goal of this project was to assess the quality of the MAF by checking the completeness and accuracy of the coverage, as well as the block-level geocoding, of the addresses in the initial MAF at the national and census division levels. The operation took place before the Census Bureau conducted its Census 2000 address improvement operations. But first, the agency undertook a pilot study in summer 1997 to test the operational feasibility of using the same field methodology that was used for the operation that checked the accuracy of the addresses and population for the test censuses in 1995 (see the discussion of Integrated Coverage Measurement in Chapter 2, "Planning the Census"), as well as to test some steps developed specifically for MAF QIP. That is, field staff were given blank address registers and TIGER-generated maps of representative clusters of blocks. In addition to listing the addresses in the assigned areas, they were instructed to enter a map spot for every residential structure on their copy of a Census Bureau map, regardless of whether an address was city-style or non-city-style. The pilot covered a sample of about 2,500 HUs in TEA 1 areas in six representative counties scattered around the country—a total of 15,000 sample HUs. The addresses were listed from June 30 through August 15, 1997, using July 15 as the reference date for existing HUs. These were compared to a November 1997 version of the MAF—a MAF whose addresses reflected resolution of 90 percent of the addresses referred to MAFGOR. While the different dates and the incompleteness of the MAFGOR resolution limited the usefulness of the findings, the pilot enabled the Census Bureau to revise the procedures to more exactly fit the needs of MAF QIP.⁴⁷

In three waves from April through June 1998, field staff listed approximately 170,000 addresses in 7,384 block clusters in TEA 1 areas in 114 counties. Some counties in the second and third waves were checked in coordination with the American Community Survey. The Census Bureau's Decennial Statistical Studies Division matched these addresses by computer against the MAF and reconciled all nonmatched cases in the field during May to September 1998. With the qualification that the MAF did not yet reflect a number of pending future coverage improvement operations,

⁴⁶ U.S. Census Bureau, Marketing Services Office, Activity Report, March 1998; and U.S. Census Bureau, "Census Bureau, First Data Solutions Announce Partnership," CB98-207, Nov. 5, 1998. First Data Solutions took back its former name, Donnelley Marketing, in the spring of 1999. First Data Corporation, the parent company of Donnelley Marketing, sold Donnelley to InfoUSA in July 1999.

⁴⁷ Joseph Burcham and Mark Gorsak, "1997 Master Address File Quality Improvement Program Pilot Study," April 16, 1999.

the results at the national level suggested that the MAF was missing 9 percent of all HUs and included 13 percent that did not exist or were duplicates, 6 percent that were geocoded erroneously, 6 percent that could not be geocoded (i.e., there was a problem with the TIGER database), and 0.1 percent that reflected nonresidential addresses that were actually residential. At the census division⁴⁸ level, undercoverage ranged from 5 to 16 percent, overcoverage from 8.5 to 16 percent, erroneous geocoding from 2.5 to 11 percent, ungeocodables from 2 to 12 percent, and nonresidential misidentification at less than 0.25 percent. The data highlighted the need for the Census Bureau to perform a detailed review of the address records in TEA 1 areas and thereby supported its plan to implement the block canvassing operation, coordinated with the input from GUs for LUCA 1998. The Census Bureau did not add the addresses and changes found by MAF QIP to the MAF because that information could “pollute” the file for future evaluations of operations in TEA 1. They were stored in a MAFUF and could have been matched/added to the MAF when no longer needed for Census 2000 evaluations—but that was not done as of late 2003.⁴⁹

The Census Bureau proposed performing a two-phase MAF QIP in 1999 to check the address file developed in address-listed areas. The first was to be a pilot study covering some 15,000 HUs in six counties whose addresses were listed in 1998. The other would involve the first wave of counties visited for MAF QIP in 1998 and all other counties where MAF QIP was performed in 1998 in coordination with the American Community Survey. The agency also considered doing additional MAF QIP studies in 1999 in both TEA 1 and TEA 2 areas. However, the Census Bureau canceled the proposed operations for budgetary reasons.⁵⁰

ADDRESSES FROM CENSUS 2000 FIELD OPERATIONS

The Census Bureau undertook a number of field operations to enumerate the population for Census 2000. These operations improved the content of the MAF. Of course, they also improved the content of the TIGER® database.

Update/Leave (U/L) and Update/Enumerate (U/E)

These operations conducted in early-March through early-April (U/L) and early-June (U/E) of 2000, recanvassed the blocks covered by address listing, but U/E also included some areas that had been inside the blue line. As enumerators traveled through the assigned areas, they verified and updated the list of addresses for each census collection block, corrected errors in the assignment of addresses to a block, annotated changes to the information shown on the census block maps, and left a census questionnaire at each housing unit (HU) for (U/L) or enumerated for (U/E). In all U/L areas and some U/E areas, all residential structures had to be map spotted and numbered. Addresses in U/E assignments that covered blocks with predominantly non-city-style mailing addresses needed to be map spotted; addresses in assignments whose blocks had predominantly city-style addresses did not. This meant the field operations required different procedures for recording additions and corrections to the enumerators’ preprinted lists of addresses. U/L added 1,644,174 addresses stateside, of which 1,401,169 (85 percent) were retained in the final census records; in Puerto Rico, the corresponding numbers were 111,787 and 93,607 (84 percent). For U/E, enumerators added 129,692 addresses, of which 122,375 (94 percent) were in the final records.⁵¹

From early March through mid-May 2000 for U/L, and mid-July through late July for U/E, the National Processing Center (NPC) keyed the addresses and related information, including map spot additions and corrections, into a master address file update file (MAFUF). From early May

⁴⁸ The nine census divisions are groups of states that are subdivisions of the four census geographic regions.

⁴⁹ Joseph Burcham, “1998 Master Address File Quality Improvement Program,” June 1, 1999; Joseph Burcham and Dianne Barrett, “Assessing the Quality of the Initial Master Address File for Census 2000,” Proceedings of the Survey Research Methods Section, 1999 Annual Meeting of the American Statistical Association, pp. 617–22; *Federal Register*, “Master Address File (MAF) and Topologically Integrated Geographic Encoding and Referencing (TIGER) Update Activities,” Vol. 63, No. 12 (January 20, 1998), pp. 2950–51.

⁵⁰ *Federal Register*, “Master Address File (MAF) and Topologically Integrated Geographic Encoding and Referencing (TIGER) Update Activities,” Vol. 63, No. 12 (January 20, 1998), p. 2951.

⁵¹ Frank A. Vitano, Robin A. Pennington, and James B. Treat, *Address List Development in Census 2000*, Topic Report No. 8, TR-8 (Washington, DC: U.S. Census Bureau, 2004), pp. 13–14.

through late September for U/L, and from late August through late September for U/E, the NPC digitized map revisions, including the locations of added, deleted, and corrected map spots and numbers, into the TIGER® database. However, any map spots that enumerators identified for HUs inside the blue line during U/E were not inserted into the database.⁵²

Urban Update/Leave (UU/L)

For this March 2000 operation, field staff recanvassed and delivered census questionnaires in selected blocks inside the blue line in 12 states and the District of Columbia. The primary goal was to ensure that census enumerators delivered each questionnaire to a specific HU that matched the Census Bureau's address list in selected census blocks. These were blocks where staff in the regional census centers (RCCs) thought that a letter carrier would have difficulty delivering questionnaires to the specific addresses in the master address file (MAF). Perhaps the housing units did not have individual mailboxes (for instance, the mailboxes in some buildings may have been ripped out) or the residents generally picked up their mail at post office boxes because the USPS did not deliver mail to their homes—or the letter carrier simply left the mail in the lobby of a multiunit structure and let the residents sort it out. Therefore, Local Census Office (LCO) staff attempted to deliver a questionnaire to each designated HU, thereby avoiding having a respondent complete a census questionnaire intended for another apartment or not receiving a questionnaire at all. The residents of the appropriate address could then mail their completed questionnaire to the Census Bureau. When the enumerators delivered the questionnaires, they also verified and updated the list of addresses and the map of the assigned areas.

Although census planners thought that many of the HUs in UU/L areas would be in multiunit structures, and well over half the addresses were in census tracts likely to house the most difficult-to-count members of the population, postcensus analysis showed that fewer than half—44.2 percent—of the UU/L addresses actually were in multiunit structures. Some Census Bureau staff understood that a primary target of UU/L would be apartment buildings that the U.S. Postal Service (USPS) designated as “drop points”—that is, letter carriers simply dropped all the mail for the structure in a convenient location—but the regional offices (ROs)/RCCs in fact generally did not know where or whether the USPS had designated any structures in an area as drop points. Subsequently, the postcensus evaluation determined that fewer than 1 percent of UU/L addresses were officially treated as drop-point addresses. The intent for UU/L to include urban communities where a substantial number of residents chose to receive their mail at post office boxes did not work out either, since only 43 addresses fell into this category.

The RCCs decided on the need for UU/L and identified the blocks in which it would take place. Eight of the 12 RCCs participated in UU/L, which was carried out by 51 LCOs. Each block constituted an assignment area (AA), and the 12,843 AAs and 267,005 addresses in the decennial master address file (DMAF) were grouped into field assignments (FAs), each of which contained approximately 250 addresses—considered to be a reasonable workload for a UU/L enumerator. (The 1990 census UU/L operation, which targeted primarily inner-city blocks with 500 or more units in multiunit public housing, covered only 346 census blocks and 55,365 housing units in six cities.) The enumerators added 13,131 addresses, a 5 percent increase, but only 10,455 (less than 80 percent) of these were retained in the census—still an almost 4 percent increase. From early March through late April 2000, the NPC keyed address additions and corrections for each AA (block) into a MAFUF for the GEO to insert into the MAF, and from mid-April through mid-May 2000, the NPC digitized map updates for insertion into the TIGER® database.⁵³

⁵² U.S. Census Bureau, “Program Master Plan: Census 2000 Update/Leave,” Census 2000 Informational Memorandum No. 89, January 2, 2001; “Program Master Plan: Census 2000 Update/Enumerate,” Census 2000 Informational Memorandum No. 79, November 9, 2000; Robin A. Pennington, “Evaluation of the Update/Leave Operation,” Census 2000 Evaluation No. F.10, June 6, 2003; Miriam Rosenthal, “Update/Enumerate,” Census 2000 Evaluation No. F.12, December 10, 2002.

⁵³ U.S. Census Bureau, Census 2000 Informational Memorandum No. 88, “Program Master Plan: Census 2000 Urban Update/Leave,” January 2, 2001; Miriam Rosenthal, “Urban Update/Leave,” Census 2000 Evaluation F. 11, October 3, 2002.

List/Enumerate (L/E)

This enumeration of the population took place in the most sparsely settled areas of the nation, where the Census Bureau decided that it would be more effective to have enumerators take the census in the traditional manner than to use the mail and follow-up methods used elsewhere. L/E took place March to April of 2000, except in Alaska, where it began on January 20 to try to complete enumeration before the spring thaw made travel to some 27,000 housing units difficult. As the enumerators completed census questionnaires by conducting face-to-face interviews at the housing units in their assigned blocks, they also recorded addresses and related information for each living quarters, assigned map spots and numbers, and updated the information shown on census block maps. This operation took place in all or part of 204 U.S. counties, adding more than 419,000 addresses to the MAF (0.4 percent of the nation's HUs), including the 27,000 in "Remote Alaska." The more than 125,000 housing units in American Samoa, Guam, the Northern Mariana Islands, and the Virgin Islands also were enumerated by the list-and-enumerate method. The NPC keyed the addresses and map spot numbers for stateside areas into a MAFUF from late June through late July 2000 and digitized map revisions and the locations of map spots and numbers into the TIGER® database from early August through late September. Although it digitized the map information for the Island Areas from mid-October through early November 2000 and began keying the address register information on November 8, the NPC did not complete the latter operation until July 12, 2001.⁵⁴

Redelivery of Undeliverable Questionnaires (UAA Redistribution Operation)

The Census Bureau anticipated from previous experience that local post offices would return an estimated 12 million mailout/mailback (MO/MB) census questionnaires because, for various reasons, they did not deliver mail to the specified addresses. The two major reasons were that a local post office could not match an address to a carrier route or that the address was not recognized by a letter carrier. The USPS and the Census Bureau referred to these as being undeliverable as addressed, or UAAs.⁵⁵ The agency wanted to know where it would be most effective to have enumerators try to redeliver these questionnaire packages, because doing so would be likely to both improve the mailback rate and reduce the workload for the nonresponse follow-up operation. Therefore, in order to prepare staffing plans for this questionnaire delivery operation, the Field Division (FLD) needed to know where the DMAF was likely to contain concentrations of addresses that local post offices might find were not deliverable.

To identify the potential locations of concentrations of UAAs, GEO, in August 1999, extracted a subset of the DMAF-eligible addresses from the MAF. These were addresses coded to TEAs 1 and 6 that did not have a ZIP+4 code because the GEO was not able to match them to the ZIP+4 file of approximately September 1998. GEO sent a tape of these approximately 3.5 million addresses to the USPS, which used its Address Element Correction matching software to check them against its most current records. The Decennial Statistical Studies Division (DSSD) analyzed the flags that the USPS match had assigned to the addresses in the file, which identified fewer than 2 million unmatched addresses. DSSD supplemented this information with other data, including the 1990 census rates of vacant HUs in selected counties, the number of HUs in ZIP Codes that only had post office box delivery, and ZIP Codes in which substantial numbers of Local Update of Census Addresses (LUCA)—added addresses had not been found during LUCA Field Verification or block canvassing. DSSD then summarized the addresses by ZIP Code so that FLD staff at headquarters, the RCCs, and the affected LCOs could estimate in which ZIP Codes (and the related LCOs) large numbers of HU addresses might be UAAs. ZIP Codes that crossed an LCO boundary were assigned to a single LCO. That LCO attempted to deliver a questionnaire to every assigned address, regardless of whether the address was located within it.

⁵⁴ U.S. Census Bureau, "Program Master Plan: Census 2000 List/Enumerate Program Master Plan," Census 2000 Informational Memorandum No. 46, March 2, 2000; U.S. Census Bureau, "Program Master Plan: Census 2000 Remote Alaska," March 8, 2000; Frank A. Vitrano, Robin A. Pennington, and James B. Treat, *Address List Development in Census 2000*, Topic Report No. 8, TR-8 (Washington, DC: U.S. Census Bureau, 2004), pp. 14–15.

⁵⁵ Prior to Census 2000, the Census Bureau referred to them as postmaster returns (PMRs).

The USPS instructed its local post offices to send all UAAs for the selected ZIP Codes to a central facility (a USPS Processing and Distribution Center/Facility [PDC]) for their area, rather than to the NPC's Jeffersonville, IN, return address on the envelope. The RCCs designated one LCO in a MO/MB area to serve as the "lead" LCO, to perform the pickup from the PDC and coordinate the distribution of the questionnaires to the other LCOs. On March 18, 2000, staff of the lead LCOs picked up almost 4.2 million UAAs—fewer than the 6 million the Census Bureau had anticipated—from 70 USPS facilities for the targeted ZIP Codes from selected PDCs. (All other UAAs, including those received after March 18, were forwarded by the PDCs to the NPC, which recorded the fact that they were UAAs.) After the UAAs were checked in by the LCOs, the UAA redistribution operation took place from March 25 through April 7. The LCOs delivered approximately 1.7 million UAA questionnaires and sent more than 2.4 million unsuccessful and unattempted UAAs to the NPC, which recorded the fact that Census Bureau staff could/did not deliver them. During this operation, the enumerator was to complete a form for each address, indicating "successful" or "unsuccessful" and, if the latter, the reason. Most of the unattempted cases were in scattered ZIP Codes that did not have a significant percentage of UAAs in relation to the size of the total mailout; FLD decided that it was not cost-effective to try to find these addresses via this operation. FLD also did not attempt to deliver UAAs in a ZIP Code if at least 25 percent of the UAA unattempted-to-deliver addresses had been previously flagged in the DMAF as "not found" during *both* block canvassing and LUCA Field Verification, nor if there were at least 500 such "double killed" addresses in a ZIP Code. All addresses for which the Census Bureau did not attempt to deliver UAAs (other than the double kills) eventually would be covered by subsequent operations.⁵⁶

P.O. Box-Only Addresses in TEA 1

For several areas in TEA 1, the local post offices informed the Census Bureau that they could not deliver questionnaires to the specified city-style addresses for some pockets of housing because all the residents received their mail at post office boxes. Also, complaints were received from people in such areas who reported that they had not received questionnaires. These areas had been included inside the blue line even though their residents received mail only at post office boxes because they represented small pockets of such housing within the blue line, or areas that the RCCs had expected to be changed to city-style mail delivery by Census Day, or areas that the RCCs inadvertently had included inside the blue line even though the city-style addresses were not used for mail delivery. A related problem was that the Census Bureau had not updated the addresses in these areas since block canvassing because new non-city-style addresses would not have been provided by the DSF nor by participants in the New Construction program. Some of these areas had been identified by the RCCs in time to be included with the UAA redistribution operation (see previous section) or the nonresponse follow-up operation (see next section), but others required the agency to take a number of steps.

The RCCs informed GEO about blocks that they knew were affected by this problem and had not been included in the UAA redelivery. In mid-April 2000, GEO matched information for post office box-only ZIP Codes (outside of multi-ZIP Code places) against its records for blocks that contained such ZIP Codes in TEA 1. The result was more than 6,000 blocks in 935 ZIP Codes in more than 300 counties. To reduce the workload to a manageable size, ZIP Codes with fewer than three blocks were dropped from potential inclusion in a catch-up program. In the remaining counties, GEO printed out the blocks and their addresses for 50 geographic entities; they contained 1,608 blocks, with the smallest number of blocks in a geographic entity being 11. After the nonresponse follow-up operation, but before the coverage improvement follow-up (CIFU) operation (see the "Coverage Improvement Follow-up" section), the LCOs verified and updated the addresses in these blocks via a "windshield check" (LCO staff checked addresses by looking for new housing units while doing a drive-by canvass of each specified block). GEO matched these addresses against the MAF to be sure they had not been included via some other census operation. Addresses not accounted for were included in CIFU.

⁵⁶ Susan M. Miskura to John H. Thompson, "Undeliverable As Addressed (UAA) Redistribution Operation," Census 2000 Decision Memorandum No. 99, February 17, 2000; U.S. Census Bureau, "Program Master Plan: Census 2000 UAA Redistribution," Census Informational Memorandum No. 61, rev. 1, October 6, 2000.

Nonresponse Follow-Up (NRFU)

This Census 2000 operation was designed to enumerate, by visits, any HU for which the Census Bureau did not have a completed questionnaire in MO/MB and U/L (including urban update leave (UU/L) areas by April 11, 2000. This operation attempted to ensure a response for each occupied HU and, in MO/MB areas, to create a response for each vacant HU. It also verified the status of addresses identified as vacant, duplicate, nonexistent, or nonresidential during NRFU. UAA addresses that were not found during or included in the UAA redelivery operation were searched for, and those UAA addresses that really represented HUs were enumerated. Although it was not the primary goal of NRFU, enumerators could add and enumerate HUs if they discovered missing ones that existed on Census Day. The Census Bureau also conducted ad hoc “windshield surveys” when whole areas seemed to be missing from the address list or the mailout; these took place from April 27 through June 26, 2000.

NRFU involved some 42,373,000 addresses, or 35.6 percent of the eligible workload (number of HUs to which questionnaires were delivered by USPS or census personnel). Before delivering the addresses to be used for NRFU, GEO provided a test state (Vermont) to the Decennial Systems and Contracts Management Office (DSCMO) to ensure that all NRFU processes and products were as expected. Addresses deleted or classified as vacant for the first time during NRFU were rechecked during CIFU before the Census Bureau accepted this information. NRFU added some 689,000 addresses to the MAF and DMAF: almost 467,000 inside the blue line and more than 222,000 outside. While GEO could have the computer check the city-style addresses for possible duplication, that could not safely be done for the non-city-style addresses. GEO originally had not planned to enter the non-city-style addresses to the MAF—rather, GEO would retain them temporarily in a separate MAFUF—in order to avoid possible duplication. However, the small number of non-city-style addresses indicated that the enumerators had checked their maps before adding the addresses and map spots, and therefore had followed proper procedures. The Census Bureau decided to accept the validity of the addresses and map spot information and added these addresses to its address files. This avoided the time-consuming special processing that would otherwise have been involved. However, NRFU also deleted more than 6 million addresses, including more than 4,850,000 in MO/MB areas—primarily due to duplicated addresses, but also to questionnaires with no addresses or incomplete ones. It should be noted that both the added and deleted numbers are exaggerated because to move an HU from one block to another on the address list required a delete-and-add action, and addresses added during the U/L operation may have been re-added by the NRFU enumerators because they could not be recorded in time to appear in the address registers—but no better numbers are available.

In MO/MB areas, the LCOs provided new maps for the NRFU operation. These maps incorporated changes made for roads and streets during previous operations. In U/L areas, the agency provided enumerators with photocopies of the maps used during the U/L operation. The enumerators were instructed to revise the maps if they found omissions or errors, including additions and deletions to the map spots and numbers. However, this information was not added to the TIGER® database until after the maps and tabulation block numbers had been finalized for Census 2000.⁵⁷

Residual NRFU (R-NRFU)

Subsequent to NRFU, the Census Bureau undertook a residual operation—known as R-NRFU—to enumerate NRFU cases that did not have a record of data capture in the data capture centers (DCCs) and that were not included in the CIFU operation. The bulk of these cases consisted of questionnaires that “disappeared” before being processed by the appropriate DCC, and therefore the residents at the specified addresses—typically no more than several hundred in any LCO—had to be reenumerated. However, the enumerator could find that an address did not qualify for inclusion in the census—the address was nonresidential, nonexistent, etc., on April 1—or was incorrect, which would be duly recorded and eventually result in correction of the MAF. Unlike with

⁵⁷ U.S. Census Bureau, “Program Master Plan: Census 2000 Nonresponse Follow-up,” Census 2000 Informational Memorandum No. 26, rev. 1, May 7, 2001; Frank A. Vitrano, Robin A. Pennington, and James B. Treat, *Address List Development in Census 2000*, Topic Report No. 8, TR-8 (Washington, DC: U.S. Census Bureau, 2004), pp. 15–16; Darlene A. Moul, “Nonresponse Follow-up for Census 2000,” Census 2000 Evaluation No. H.5., July 25, 2002.

NRFU, the enumerators were not allowed to add housing units. The NRFU AAs were re-used for R-NRFU, but typically an AA contained only a few addresses. An FA consisted of several AAs, so an enumerator's workload contained 20-30 HUs. R-NRFU used the same maps as NRFU. The operation visited 121,792 addresses in three waves from mid-July through mid-September 2000, approximating the timing of the CIFU waves (see below).⁵⁸

Field Follow-Up (FFU)

This operation was similar to—but not the same as—NRFU for areas where the Census Bureau directly enumerated the population; that is, list/enumerate (L/E) areas (except “Remote Alaska”) and update/enumerate (U/E) areas. The FFU operation took place from mid-May through early July 2000. Using the map spots and numbers on the original L/E and U/E maps as a guide, FFU enumerators visited addresses on a specially prepared list. The original enumerators in both areas had classified these as vacant and, in U/E areas, the list included deleted addresses as well. The goal was to verify that the original enumerators had recorded the information correctly or to enumerate the housing units. FFU enumerators also completed long-form questionnaires in areas for which the Census Bureau did not obtain the appropriate number of such questionnaires, resolved questionnaires with inconsistent and/or missing entries, and reenumerated HUs for which the agency did not have completed questionnaires. The same AAs as in the R-NRFU were used, with the LCOs combining AAs into FAs containing about 20 housing units. FFU enumerators were allowed to add missed housing units and to correct and update the block maps if necessary. Ultimately, in addition to improving the enumeration, this operation served to correct addresses in the DMAF and MAF, although the information was not added to the TIGER® database until after the maps and block numbers had been finalized for Census 2000. FFU did not add new addresses, though it confirmed addresses that should be deleted, and it restored addresses that should not have been deleted; indeed, no addresses had yet been removed from the DMAF or MAF.⁵⁹

Coverage Improvement Follow-Up (CIFU)

The goal of this procedure was to have enumerators visit housing units with newly obtained addresses and to resolve conflicting information about the existence of specific addresses, thereby improving the completeness of the census. Additional “windshield surveys,” like those in NRFU, were done to try to identify missed areas. CIFU was carried out by the LCOs in three waves, beginning 3 weeks after they finished the NRFU operation; that is, from late June through mid-September 2000. The end of CIFU was the last date that living quarters could be added to the census results. As part of the Census Bureau's efforts to follow up on every possible residential address, LCO enumerators visited and, if appropriate, enumerated or corrected the records for about 8,854,300 HUs including:

- Addresses obtained for MO/MB areas after it was too late to hand-address and send a questionnaire—but first GEO had to ensure that the addresses had not been accounted for in the MAF as the result of some other operation. Many of these addresses from the February 2000 DSF were provided by government officials for the New Construction program, but were geocoded late via the Master Address File Geocoding Office Resolution (MAFGOR) and targeted map update (TMU) operations, and included all nonmatched geocoded addresses from the April 2000 DSF. CIFU also included addresses added from the LUCA appeals process too late to be included in the U/L universe, and so not added by the U/L enumerators. These addresses therefore may not have had questionnaires delivered to them.
- Addresses deleted or identified as vacant *for the first time* during the NRFU operation in both MO/MB and U/L (including UU/L) areas, except those that had been classified by enumerators as “seasonal, recreational, or occasional use units or, in MO/MB areas, for which the USPS returned an undeliverable questionnaire. Vacant units comprised 44.4 percent of the CIFU workload, and deleted units, 29.4 percent.

⁵⁸ Fred R. Borsa and Christine L. Hough, *Data Collection in Census 2000*, Census 2000 Topic Report No. 13 (Washington, DC: U.S. Census Bureau, 2004), pp. 17–24.

⁵⁹ U.S. Census Bureau, “Program Master Plan: Census 2000 List/Enumerate Program Master Plan,” Census 2000 Informational Memorandum No. 46, March 2, 2000, pp. 19–20; Fred R. Borsa and Christine L. Hough, *Data Collection in Census 2000*, Census 2000 Topic Report No. 13 (Washington, DC: U.S. Census Bureau, 2004), p. 17.

The CIFU operation, which re-used the maps used for NRFU and R-NRFU, also involved a visit to every housing unit in MO/MB and U/L (including UU/L) areas for which the Census Bureau did not have a completed questionnaire—especially U/L addresses that were added by enumerators too late to be included in NRFU and MO/MB addresses that the USPS returned as undeliverable—as well as addresses with selected other problems associated with their questionnaires. Before delivering the addresses to be used for CIFU, the GEO provided a test state—again, it was Vermont—to the DSCMO to ensure that all processes and products were as expected. Enumerators were assigned NRFU AAs and census tracts, which, if necessary, were grouped into FAs of 40 to 50 housing units—a sufficient workload to complete an FA in a week. An enumerator was given at least three FAs for the 3-week duration of CIFU. Originally, the LCOs were instructed to send the completed CIFU maps to the NPC; a mid-July 2000 revision instead required that the LCOs retain the maps for use in the next operation.

CIFU added 10,465 housing units and deleted almost 2,628,000. Updates to street features and addresses found during CIFU were added to the TIGER® database and the MAF after maps and block numbers had been finalized for Census 2000.⁶⁰

Be Counted and Telephone Questionnaire Assistance (TQA)

In areas that tended to be undercounted, the Census Bureau placed “Be Counted” census questionnaires at thousands of sites (businesses, churches, community centers, etc.) where anyone who believed he or she was not counted could pick one up, complete it, and send it to the agency; these forms contained the 100 percent questions only. This operation took place in ALL areas covered by Census 2000—it was not limited to MO/MB areas.

When a person called a toll-free telephone center to report that the person or the household had not received a questionnaire or was not enumerated, the NPC labeled and mailed a questionnaire if the person provided a mailing address. If a non-city-style address was provided, the telephone operator asked the caller for a location description. However, some people offered to answer the census questions by telephone and include the address or location description. This was referred to as the Telephone Questionnaire Assistance (TQA) operation.

The addresses acquired through both of these operations were part of the “non-ID questionnaire” process. Those that did not match an address recorded in the MAF were sent to the appropriate LCO for field verification, while duplicate records were rejected. To ensure that unmatched and duplicate addresses (and their related questionnaires) were valid, these addresses were flagged uniquely in the MAF and on a special set of address listing pages that contained all known residential addresses in the blocks in which the agency expected to find the added addresses. In addition to verifying the BC/TQA addresses, this operation also checked on addresses for which the Census Bureau received a mail return even though the address had already been deleted and confirmed as a valid deletion by two previous operations (for instance, both block canvassing and LUCA 1998 Field Verification had failed to find the address). There were approximately 311,000 such addresses. With appropriate maps and lists in hand, listers working out of the LCOs tried to find each assigned address. A lister’s job was to ensure that each address really existed on the ground, represented a real residence, and did not duplicate an address already in the file by another name (e.g., an apartment complex name vs. the complex’s street address). The lister entered an appropriate action code on the listing page to report what was found for each address. The LCOs keyed the action codes into the Census 2000 control system, and the Technology Management Office (TMO) transmitted a file with this information to DSCMO, which flagged any addresses to be deleted into a MAFUF that was sent to the GEO to update the MAF.

In MO/MB areas, the listers used the set of maps previously used for U/L and NRFU, rather than a new set of maps. However, for blocks in U/E and L/E areas that had an address involved (or likely to be involved) in this operation, the LCOs had to reprint the enumeration maps. In U/L, U/E, and

⁶⁰ U.S. Census Bureau, “Program Master Plan: Coverage Improvement Program,” Census 2000 Informational Memorandum No. 81, November 17, 2000; John R. Clark and Darlene A. Moul, *Coverage Improvement in Census 2000 Enumeration*, Census 2000 Topic Report No. TR-10 (Washington, DC: U.S. Census Bureau, 2004), pp. 11–13; Frank A. Vitano, Robin A. Pennington, and James B. Treat, *Address List Development in Census 2000*, Census 2000 Topic Report No. 8, TR-8 (Washington, DC: U.S. Census Bureau, 2004), pp. 16–17.

L/E areas, a lister found an assigned address and it represented a housing unit that did not already appear in the MAF, the lister added a map spot and a preassigned map-spot number to the appropriate block map; these numbers had been printed with the addresses on each set of address listing pages. Listers also were instructed to update the streets/roads and associated names on the maps.

This operation was called Be Counted/TQA Field Verification (BC/TQA FV). The LCOs re-used the maps that had been used for NRFU and CIFU in mail census areas, and in L/E and U/E areas, printed another copy of the pre-enumeration AA locator, AA maps, and block maps that covered the probable location of the addresses to be verified. AAs consisted of individual blocks, combined so an FA contained about 33 addresses, or about 3 days' work for a lister. Including the non-ID questionnaire operation, an estimated 900,000 addresses were assigned to 410,000 AAs. This operation was carried out from July 31 through August 19, 2000, in the same three waves as CIFU. After elimination of unacceptable addresses and those already in the MAF, the Be Counted operation added 58,380 addresses and the TQA program added 53,712.⁶¹

Household and Address Field Verification (HA FV), or Invalid Return Detection (IRD)

The goal of this operation was similar to BC/TQA FV: to verify, in the same time frame and using the same types of maps, the validity of selected addresses in MO/MB, UU/L, and U/L areas. But unlike BC/TQA FV, it required verification of the name(s) reported on the questionnaires for selected addresses, especially duplicate addresses. Thus, the goal was to check not only whether addresses represented valid housing units, but also whether the names reported were for real people. It was to take place at the same time as the BC/TQA FV operation. However, when the Census Bureau determined there was no significant clustering of Be Counted forms in any single LCO, it decided to drop this operation and let the BC/TQA FV operation find any problem situations. GEO calculated whether "clustering" occurred, based on a specified ratio of Be Counted forms received to the total number of addresses in a specified area.

Questionnaires Without a MAF Identification

Addresses contained in the MAF were labeled with unique, preassigned MAF identification (MAFID) numbers. Some census operations resulted in questionnaires that did not have a MAFID; that is, questionnaires generated by respondents rather than the Census Bureau, and therefore unlabeled. The agency referred to these as "nonidentification Master Address File (non-MAFID) questionnaires." They were initiated by respondents via the Be Counted and Telephone Questionnaire Assistance operations and by travelers and people with multiple residences who reported that they had a "usual home elsewhere." The identification of a home address on a military or maritime questionnaire or on a questionnaire used by a person at a service-based facility (primarily soup kitchens, shelters for the homeless, and selected nonsheltered outdoor locations) or group quarters also created a non-MAFID questionnaire. Addresses for in-movers were also to be included, but were not available in time. The data capture operation assigned a "Customer ID"—a number that served as a temporary identifier—to these questionnaires.

GEO attempted to match address information on each non-MAFID questionnaire against the MAF to determine whether the address was already in the file. Questionnaires that did not have city-style addresses were matched to a subset of the MAF that contained only addresses in blocks coded to TEA 2, 5, or 9. If a match was successful, the questionnaire was assigned the same MAFID; GEO also recorded the Customer ID in the MAF. GEO also tried to use the TIGER® database

⁶¹ U.S. Census Bureau, "Program Master Plan: Census 2000 Questionnaire Assistance Centers/Be Counted Program," Census 2000 Informational Memorandum No. 103, May 1, 2001; U.S. Census Bureau, "Program Master Plan: Census 2000 Telephone Questionnaire Assistance Program," Census 2000 Informational Memorandum No. 111; U.S. Census Bureau, "Assessment Report: Census 2000 Telephone Questionnaire Assistance (TQA)," Census 2000 Informational Memorandum No. 144, September 13, 2004; Frank A. Vitrano, Robin A. Pennington, and James B. Treat, *Address List Development in Census 2000*, Census 2000 Topic Report No. 8, TR-8 (Washington, DC: U.S. Census Bureau, 2004), pp. 17–19; Jon R. Clark and Darlene A. Moul, *Coverage Improvement in Census 2000 Enumeration*, Census 2000 Topic Report No. 10, TR-10 (Washington, DC: U.S. Census Bureau, 2004), pp. 9–10; Fred R. Borsa and Christine L. Hough, *Data Collection in Census 2000*, Census 2000 Topic Report No. 13, TR-13 (Washington, DC: U.S. Census Bureau, 2004), pp. 12–14.

to assign a county code and collection block number to the address information, regardless of whether the address match was successful; that is, the address might fit into an address range that was already recorded in TIGER. In the case of a Be Counted questionnaire on which the respondent provided no address for a “usual home,” GEO attempted to geocode the questionnaire by using the geographic information—place/county/state/ZIP Code—the respondent entered on the form. Because of the unusual city-style addresses encountered in Puerto Rico, GEO contracted with a company called Seek Data to match and attempt to geocode the 935 non-MAFID questionnaires for that area; Spanish-speaking clerks in the NPC contacted respondents whose questionnaires required telephone follow-up.

Next, clerks at the NPC reviewed unmatched addresses—about 26 percent of the non-MAFID questionnaires—of questionnaires that had been filled out improperly, or that had scanning or keying problems and other obvious errors. They also searched a commercial database to see if an address could be corrected or if the county had been misidentified. If a questionnaire included a telephone number, or a phone number could be found for the address in a commercial database, the NPC called the housing unit to try to obtain the needed information. Finally, the NPC used special software—the Interactive Matching and Geocoding System—that allowed a clerk first to retrieve each unmatched address and, after resolution and correction of that record, to check against the MAF and TIGER databases to see if the change had resolved the problem. If a respondent-initiated, non-MAFID questionnaire was received for a new address that could be geocoded FLD staff checked the address on the ground to ensure that a living quarters really existed. This was done as part of the BC/TQA field verification. After update of the MAF and TIGER databases, GEO rematched the corrected and added addresses to the TIGER database for assignment of geocodes. GEO then provided DSCMO with a MAF extract from which to update the DMAF. DSCMO determined whether people on questionnaires with matched addresses needed to be added to those housing units.

Separate non-MAFID problems involved questionnaires on which enumerators had failed to place a prenumbered label (a Processing ID number, which served as a temporary MAFID), the label had fallen off, the number wasn’t transcribed in the address register, or the number was miskeyed. This could occur for HUs enumerated during the L/E operation and for HUs added during the U/L, U/E, GQs, NRFU, and CIFU operations. For NRFU and CIFU non-ID cases, GEO simply added non-matched addresses and their Customer ID numbers to the MAF; if an address matched the MAF, the Processing ID number was added to the MAF record. For the other census operations, because the NPC had keyed these addresses into the MAF from the address registers, most of the addresses on the non-MAFID questionnaires could be matched and, if necessary, the Processing or Customer ID number was added to the MAF. If non-MAFID questionnaires could not be matched, GEO tried to use the map-spot number and related information to find the address. If that did not find the address, GEO added the unmatched address and Customer ID number to the MAF.

The operation started on April 3, 2000, and continued on a flow basis through September 6. GEO had to deliver a MAF extract of all processed records to DSCMO by the end of June so that the field verification could begin in late July; as noted earlier, the field check continued through mid-August. DSCMO delivered the last non-MAFID file to GEO on July 31. Eventually, GEO provided DSCMO with an outcome code for every non-MAFID address it had delivered. Any non-MAFID addresses that were found not to exist or whose existence could not be determined were dropped from the census and flagged in the MAF. However, any persons whose address matched one already in the MAF was added by DSCMO to the rosters of verified living quarters until the August cutoff. DSCMO subsequently delivered a file with the field verification results to GEO which flagged its records to reflect that information. The NPC digitized the map spots added by the field work to the TIGER database mid-2001.⁶²

⁶² Megan C. Ruhnke, “An Assessment of Addresses on the Master Address File ‘Missing’ in the Census or Geocoded to the Wrong Collection Block,” Census 2000 Evaluation No. F.15. August 19, 2003; Karen Medina, “Assessment Report: Census 2000 Processing (Including BCF/TQA Field Verification),” Census 2000 Informational Memorandum No. 141, September 25, 2003.

Elimination of Duplicate Housing Units

Because several sources and methods were used to update the address list for Census 2000, the MAF was susceptible to having multiple records for the same living quarters—generally two (or more) addresses assigned to the same housing unit. (This did not involve duplicates found for non-MAFID questionnaires.) Although apparent exact duplicates were identified and subjected to a review and, if appropriate, deletion of one of the entries, and various field operations sought to pinpoint other duplications, these steps were not always effective in producing the desired results. The effectiveness of field work was subject to the abilities of individual members of the field staff to perform the required operation in a specific area within a fixed time frame; however, all operations were subject to a quality assurance check and a clerical review of the collected and annotated information. Because the goal of the Census Bureau was to have as complete an address list as possible, conservative rules for identifying probable duplication tended to retain addresses even when there were indications that they could be duplicates.

The Census Bureau compared independent estimates of housing unit counts to the counts in the DMAF in July 1999 and January 2000 and found that field operations had reduced an independent estimate of duplicate housing units from 6.8 percent to 3.2 percent. Agency staff identified specific counties where differences were relatively large. During the week of June 18, 2000, field staff visited targeted collection blocks in three large cities: New York, Baltimore, and Chicago. Thirteen percent of the addresses they found either were duplicates or did not exist, which confirmed the assumption that the address file contained overcoverage. While the NRFU and CIFU operations might uncover addresses that were duplicates if a reply was obtained from only one—or neither—of the duplicates, they would not catch residents that had returned more than one questionnaire. Therefore, the Census Bureau instituted an automated process that would identify probable duplicate housing units. GEO and DSCMO developed algorithms to identify addresses that were likely to be duplicates, based on address matching, followed by person matching, followed by personal characteristics matching. (For addresses with more than two duplicated entries, the several pairs were treated as separate duplicate combinations that required matching.) After applying various criteria to the 4,688,442 possibly duplicate records, 2,411,743 MAFIDs were flagged for potential deletion. This included 1,617 duplicates found by the block splits/misallocation field work while the automated process was proceeding. However, additional reviews identified many cases that probably were not duplicates, such as households that had moved and instances of questionnaire misdelivery in multiunit buildings. As a result, during November to early December 2000, the Census Bureau reinstated 1,019,057 records, so that the final combined file of duplicate MAFIDs deleted from the hundred percent census unedited file was 1,392,686; deletion from that file avoided double-counting data for 1,352,193 occupied and 40,493 vacant housing units. All deleted addresses were retained with a special flag in the MAF.⁶³

Addresses Changed During Enumeration

For some operations—U/L, U/E, NRFU, and CIFU—respondents or enumerators changed the pre-printed addresses on a relatively few questionnaires. At the behest of GEO the questionnaire contained a section where an address correction could be recorded. Perhaps an area's addresses had been changed to city-style in the 15 to 20 months since address listing had taken place, perhaps a lister had recorded an E-911 address as a mailing address, etc. The Census Bureau wanted to capture the corrected addresses, and so the address changes on such questionnaires were picked up during the processing operation and reported to DSCMO. GEO tried first to match a new address to see if it was already in the MAF and second to match the MAFID to identify a changed address if it could not perform the match. The former may have identified a potential duplicate address, in which case DSCMO performed an automated check of the household roster to see whether it was indeed a duplicate; if so, one of the questionnaires would be deleted from the census. When GEO was informed about an updated address, it recorded that address in the MAF; however, the old address was retained, with a flag to identify it as a superseded record.

⁶³ Jon R. Clark and Darlene A. Moul, *Coverage Improvement in Census 2000 Enumeration*, Census 2000 Topic Report No. 10, TR-10, (Washington, DC: U.S. Census Bureau, 2004), pp. 14–15.

Accuracy and Coverage Evaluation (A.C.E.)

The purpose of this operation was to determine how well the Census Bureau counted people and housing units. The A.C.E. program is described in Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

QUESTIONNAIRE PRINTING AND MAILING

Nearly 400 million questionnaires, envelopes, and related materials were printed for use in Census 2000.⁶⁴ Census Bureau research conducted between 1992 and 1996 demonstrated that a redesigned, simplified questionnaire, combined with multiple mail contacts with respondents, could significantly improve mail response (see Chapter 2, “Planning the Census”). The simplest and least expensive method of counting household members was by employing user-friendly mailout/mailback (MO/MB) questionnaires. These MO/MB questionnaires were at the heart of census data collection. Their development, production, addressing, assembly, and distribution absorbed the bulk of the personnel and financial resources devoted to public-use forms. More than three dozen private sector contractors produced and addressed these questionnaires (as well as advance letters, envelopes, reminder cards, and related materials) following a competitive bidding process administered by the Government Printing Office (GPO).

Following substantial testing and analysis, the Census Bureau decided to use optical scanning and optical mark recognition (OMR) and optical character recognition (OCR) software to capture most of the data collected in Census 2000. The decision to adopt this technology, together with a hiring freeze in the early 1990s that inhibited the recruitment of specialized engineering personnel and with general encouragement to outsource operations that were not inherently governmental, led the Census Bureau to open competitive bidding for the design and equipping of data capture centers and the staffing, training, and management of those centers. These contracts were awarded to Lockheed Martin Mission Systems and TRW, Inc. respectively.⁶⁵

Advances in information technology and systems reduced the cost and logistical requirements associated with processing hundreds of millions of Census 2000 questionnaires, but also increased the technical complexity involved in the design and printing processes. Together with partners from GPO and the Rochester Institute of Technology Research Center (RITRC), Census Bureau staff developed specifications for the questionnaires and related public-use forms. The quality assurance program for this phase of the census included on-site inspections and required the selection and testing of samples by Census Bureau officials, GPO staff, and contractor personnel.

Questionnaire Design and Development

The content development process is described in Chapter 2, “Planning the Census”, and the individual questions, as well as the coding and editing to which the responses were subjected, are reviewed in Chapter 3 “Population and Housing Questions.”

Beginning in 1995, the Census Bureau recognized that the design of the questionnaire might have to be modified to meet the requirements of the new data capture technology (referred to as DCS 2000). During 1995 and 1996, the Census Bureau’s Technical Services Division⁶⁶ began to develop initial specifications for the not-yet-awarded OCR and OMR hardware and software. These included such characteristics as the outside and inside dimensions of the write-in response boxes, a document integrity bar code (used to identify all pages of a form), and a series of icons that helped the respondent navigate through the questionnaire. Research on a respondent-friendly

⁶⁴ U.S. Census Bureau, Census 2000 Informational Memorandum No. 60, “Census 2000 Questionnaire Printing, Addressing, Assembly, and Distribution Program Master Plan,” June 7, 2000, Attachment J, “Stateside Questionnaire Printing.”

⁶⁵ For a description of the data capture system used for Census 2000 and of data capture center operations, see Chapter 6, “Data Capture and Processing.”

⁶⁶ Disbanded in the fall of 1996.

questionnaire also suggested that the form incorporate color as well as black print. Any text or graphics that could obscure meaningful data in the image, including lines and color used to distinguish write-in fields, had to drop out, or disappear, during scanning.⁶⁷

The Census Bureau developed and finalized the necessary specifications by August 1998, when they were delivered to GPO. Specifications could not be completed before then because, in addition to uncertainties about the questionnaire, the Census Bureau did not contract with Lockheed Martin Mission Systems for the optical scanning and OCR hardware and software until March 1997. At least some of the specifications of census questionnaires could not be finalized until the hardware and software that were to process them had been selected and tested.

That neither the layout, specifications, nor the content of the Census 2000 questionnaire had been fully determined when the agency began to search for suitable printing contractors was a challenge, but not an insurmountable one. The Census Bureau and GPO invited printing contractors to a vendors conference on October 21, 1996, for a briefing on the Census Bureau's printing, binding, and distribution needs for Census 2000. Representatives of at least 29 companies attended the conference. Census Bureau staff presented an overview of Census 2000 printing and mailing requirements, including the types and estimated quantities of forms to be printed, and procurement and delivery dates for mailing packages and other printed material. Presenters also reviewed the quality assurance program that contractors would be expected to implement and went over the planned systems for document integrity and data processing. Representatives of both agencies described the technical requirements of the census mailing packages and other forms and distributed four forms packages for evaluation. Attendees were asked for their views on ways of correcting any design features that might increase cost or reduce bidding competition. Attendees were also asked to respond to a questionnaire describing their firms approach to a number of technical issues such as printing, addressing, assembling, and distributing more than 100 million census forms.⁶⁸

During 1997 and 1998, Census Bureau staff learned that the new data capture system could not be modified to capture information from virtually any type of form. While the agency would have benefitted from having a comprehensive set of technical requirements for data capture and processing before the census dress rehearsal (conducted in the spring of 1998), such a listing was not available until the late summer of 1998. Analysis of the data capture and processing systems used in the dress rehearsal led to major changes on all forms planned for electronic data capture. These modifications included the need for document integrity on the short form, Be Counted form, and similar forms; consistent OCR answer fields for similar questions across all form types; and wider margins to allow for staple removal. In addition, the Census Bureau's decision, following the dress rehearsal, to adopt a six-person questionnaire meant that the additional text had to fit into the same boundaries as the five-person form without sacrificing user friendliness or technical requirements. Finally, the complexity of the printing contracts, including the need to print prior-to-production samples for testing, meant that print contracts had to be awarded up to 15 months prior to the start of major census operations.⁶⁹

To compile a comprehensive list of technical requirements and assure that they were communicated to, and understood by, contractors and staff from the Census Bureau and other government organizations, the agency formed the Technical Specification Contract Integration Team (TSCIT) in July 1997, which consisted of representatives from the following:

- Government Printing Office (GPO), which provided expertise about paper and ink specifications and the management of printing contracts.

⁶⁷ U.S. Census Bureau, "Forms Management Procedure, Optical Character Recognition: Technical Specifications for Design," July 29, 1996; Broderick E. Oliver, "Profile of the Census 2000 Printing Quality Program," DSSD Census 2000 Procedures and Operations Memorandum Series No. KK-F-06, September 2001, p. 6.

⁶⁸ Government Printing Office and Census Bureau Conference on Printing and Delivery of Census 2000 Census Forms, "Agenda," "Estimated Quantities of Printed Materials and Schedule," "Census 2000 Quality System," "Document Integrity," and memorandum to attendees at the Census 2000 printing vendors' conference, October 10, 1996; U.S. Census Bureau, "Forms Design and Printing Lessons Learned for Census 2000," Census 2000 DSCMO General Memorandum Series No. 01-03, May 15, 2002, p. 6.; RIT Research Corporation, "GPO/Census 2000 Vendors Conference: Questionnaire Responses," January 1997.

⁶⁹ U.S. Census Bureau, "Forms Design and Printing Lessons Learned for Census 2000," Census 2000 DSCMO General Memorandum Series No. 01-03, May 15, 2002, pp. 3–4.

- Rochester Institute of Technology Research Center (RITRC), which supplied technical guidance on paper and printing and conducted related research.
- Decennial Systems and Contracts Management Office (DSCMO), a Census Bureau office that represented the forms design, printing contracts, data capture, and data processing areas.
- Administrative and Customer Services Division (ACSD), a Census Bureau division that represented the postal and printing areas.
- Decennial Statistical Studies Division (DSSD), a Census Bureau division that guided the implementation of the quality information system.

The team met weekly and researched and evaluated such issues as dropout colors (colors that had to disappear in the digitized image of the questionnaire), color control patches (to assure that the printed colors remained within specifications), inkjet bleed-through (concern that the ink from the address and the census identification bar code could bleed through to the other side of the page, creating the possibility of false reads), document integrity (a bar code used to associate the individual sheets of a disassembled questionnaire booklet and both sides of a short form), placement of bar codes on the short and long forms, specifications for controlling spots and extraneous marks on census forms, and specifications for the color and density of the ink. The data capture staff, Lockheed Martin, and RITRC all made important substantive contributions to the development of the printing specifications required by the optical scanning equipment and the OMR and OCR systems. TSCIT delivered the necessary specifications to GPO in the summer of 1998, and GPO posted the first invitation for bid in *Commerce Business Daily Online* (CBDNet) in the fall of 1998.⁷⁰

In November 1990, the Census Bureau and the U.S. Postal Service (USPS) established a joint committee on census planning to identify and develop opportunities for cooperation in Census 2000. The committee met quarterly through 1997 and contributed to the passage of Public Law (P.L.) 103-430, which authorized the release of USPS address information to the Census Bureau for use in creating and maintaining the master address file (MAF). The committee's work also led to the agreement to provide copies of all new TIGER/Line® database files and demographic data products to the USPS to serve as the basis for that agency's geographic database.⁷¹

Beginning in 1998, liaisons from both agencies met monthly to coordinate Census/USPS operations and communicate management decisions. The national postal liaison worked for the Census Bureau's Decennial Management Division (DMD) and was the Census Bureau's primary point of contact with the USPS. USPS staff also interacted regularly with several other Census Bureau divisions, including:

- DSCMO and print contractors on matters pertaining to envelope size, bar code and sort operations, palletizing census materials, and transporting those materials for mail delivery.
- ACSD to ensure that business reply permits were active for the Census 2000 mailout and to supply the USPS with return counts of questionnaire mailing pieces so that census postage costs could be properly assessed.
- GEO to supply updated versions of the delivery sequence file (DSF) that were major inputs in the creation of the MAF and the decennial MAF (DMAF).
- FLD to coordinate the undeliverable-as-addressed program in which questionnaires that could not be delivered by the USPS were returned to post offices and held for pick up by local census office staff.

⁷⁰ Oliver, "Profile of the Census 2000 Printing Quality Program," pp. 5–8; Carol Briggs, "Census 2000 Questionnaire Printing, Addressing, Assembly, and Distribution Program Master Plan," "Census 2000 Informational Memorandum No. 60," June 7, 2000, pp. 5–8; Association for Information and Image Management, "Designing Documents for Image-Based Recognition," n.d., n.p.; Association for Information and Image Management, "Paper Forms Design Optimization for Electronic Image Management (EIM)," Technical Report ANSI/AIIM TR32, 1994.

⁷¹ U.S. Census Bureau and U.S. Postal Service, "USPS—Census Cooperation in Planning for the 2000 Decennial Census of Population and Housing," November 1993, p. 1; U.S. Census Bureau, "Program Master Plan: United States Postal Service Participation in Census 2000 Draft," see footnotes 89-91, n.d., p. 1.

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- Data capture centers (DCCs) to assist with mail acceptance, answer postal questions, and return mail erroneously delivered to the DCCs.⁷²

Printing Contracts

Census 2000 included 86 printing contracts, awarded to 40 different companies, to print the nearly 475 million public-use forms and related materials. A contracts writing team was headed by DSCMO staff and included printing and forms design specialists from ACSD and contract management specialists from GPO. This team developed specific contract content, and DSCMO established a formal contract review process that included census stakeholders both inside the Census Bureau and among outside entities, such as contractors and the USPS. The team sent comments to the contract administration staff at GPO, which incorporated them, added standard federal contracting stipulations, issued invitations for bid, and awarded the contracts.⁷³

GPO began issuing invitations for bid in September 1998 and awarding printing contracts on December 18, 1998.

A key element of the Census Bureau's plan for improving response rates in Census 2000 was a multiple-mailing strategy. The agency's initial contact with a respondent was an advance letter alerting the recipient that a census questionnaire would be delivered shortly. In July 1999, GPO awarded the contract to print, address, bar code, and assemble 125 million advance letter mailing packages to Freedom Graphic Systems, Inc., of Janesville, WI. These packages came in two forms. One hundred million packages contained a letter advising recipients to expect the questionnaires to be delivered by the USPS. The letter in the remaining 25 million packages alerted recipients that their forms would be delivered by Census Bureau personnel. Otherwise, the letters were identical. They explained why answering the census was important and that it was "required by law." The value of the printing contract was \$5.5 million. A message printed on the front of the letter in Spanish, Chinese, Korean, Tagalog, and Vietnamese referred readers to a note on the back of the letter stating that questionnaires in these languages were available by contacting the Census Bureau's National Processing Center in Jeffersonville, IN. Drafting these messages in language was contracted to Translation Solutions Corporation in Portland, OR. The translations were checked by a second contractor.

The first census contract GPO awarded was for \$9.6 million and covered the production of nearly 89 million short-form MO/MB mailing packages. It went to the Communicolor division of R.R. Donnelley & Sons. Located in Hebron, OH, Communicolor did the printing, addressing, and bar coding, and subcontracted the insertion process to Monroe/Macke, also in Hebron, OH. Communicolor subcontracted envelope production to Commercial Envelope in Altoona, PA, and cover letter production to the Nielsen Company of Florence, KY.⁷⁴ Modifications over the life of the contract meant the final award totaled a little less than \$10.1 million.⁷⁵

GPO awarded the contract for 17.8 million MO/MB long-form questionnaires to Webcraft Technologies, Inc., in North Brunswick, NJ. The Census Bureau paid nearly \$8.9 million to Webcraft and its subcontractors over the life of the contract. Webcraft printed, addressed, and bar coded the questionnaires at its New Jersey plant. Inserting the completed questionnaires into envelopes was subcontracted to Direct Marketing Association in Baltimore, MD, and Addressing Services Co. in East Hartford, CT. Webcraft also subcontracted envelope production to Oles Envelope Corp. in Baltimore, MD, and cover letter printing to Suncraft Technologies in Naperville, IL.

The USPS delivered the bulk of short- and long-form questionnaire packages during Census 2000, but the Census Bureau itself planned to deliver, in an operation called update/leave (U/L), over 20 million short form packages in small cities, towns, and rural areas across the country where

⁷² U.S. Census Bureau, "Program Master Plan: United States Postal Service Participation in Census 2000 Draft," see footnotes 89-91, n.d., pp. 2-3.

⁷³ U.S. Census Bureau, "Forms Design and Printing Lessons Learned for Census 2000," Census 2000 DSCMO General Memorandum Series No. 01-03, May 15, 2002, pp. 16-20.

⁷⁴ Oliver, "Profile of the Census 2000 Printing Quality Assurance Program," pp. 28; U.S. Census Bureau, "Components of Printing Contracts in Census 2000" (Draft), Chapter 2.

⁷⁵ U.S. Census Bureau, untitled table of printing contracts, contractors, and billings from Census 2000, Aug. 2, 2004.

the agency anticipated difficulties creating an accurate and comprehensive list of deliverable mailing addresses. The production contract called for 22.3 million short-form, U/L packages, cost \$2.7 million, and was awarded to Freedom Graphic Systems, Inc., in Milton, WI. Freedom Graphic printed the questionnaires and subcontracted with Freedom Imaging Systems in Bolingbrook, IL, for the addressing, barcoding, and insertion operations. Envelope production was subcontracted to Continental Envelope in Geneva, IL.

Webcraft Technologies won the long-form, U/L mailing package contract for 8.1 million packages at a cost of \$4.6 million. Webcraft printed, addressed, and bar coded the mailing packages and, as it had done with the MO/MB long forms, subcontracted inserting the materials into envelopes to Direct Marketing Association, Addressing Services Co., and Star Bindery, Inc., in Westville, NJ; printing the cover letter to Suncraft Technologies; and producing the envelopes to Oles Envelope Corp.

The third contact between the Census Bureau and potential respondents was the reminder card, which thanked participants who had returned their census forms and reminded those who had not to send completed questionnaires to the appropriate DCC. Forms designers at the Census Bureau designed the postcard, and GPO awarded the contract to print and address them to Moore Response Marketing Service in Green Bay, WI. The contract called for over 122 million postcards, at a cost of \$717,000. As with the advance letters, the reminder postcard came in two versions. The 100 million postcards sent to HUs in MO/MB areas were mailed first class and referenced the questionnaires that had been delivered by USPS postal carriers. The 22 million postcards sent to those in the U/L universe were mailed third class.

In addition to questionnaires designed to be completed by respondents, the Census Bureau needed questionnaires that could be administered by enumerators. The inquiries on the enumerator questionnaires asked for the same information as those delivered to HUs but were worded for a face-to-face interview in which an enumerator could insert either appropriate pronouns or the respondent's name when reading the questions. Enumerator questionnaires came in two versions: a short form and a long form. The contract for 164.3 million enumerator short forms was awarded to Quebecor Petty Printing in Effingham, IL, and cost about \$4.2 million. R.R. Donnelley Direct, Inc. in Seymour, IN, won the contract for almost 38.5 million enumerator long forms at an overall cost of \$12.1 million. R.R. Donnelley & Sons, in Gallatin, TN, stapled the printed questionnaire pages together into complete packages.

In March 1999, GPO awarded Webcraft Technologies, Inc., a \$2.2 million dollar contract to produce 12 million Be Counted forms in English and 3 million in Spanish. These forms provided a way to be included in Census 2000 for people who thought they had not received a form at their address and had not been included on anyone else's form. Be Counted forms contained the short-form questions in a respondent-friendly format and several other questions to facilitate matching the address on the completed form to the MAF. Local Census Bureau partners made these forms available at approximately 85,000 sites around the country and at Questionnaire Assistance Centers.⁷⁶

GPO contracted with more than two dozen printing companies to produce a number of other questionnaires, flash cards, flyers, guides, job aids, letters, and promotional materials used in Census 2000. Most of these contracts were valued at less than \$1 million.

The printing process used to produce most of the questionnaires was offset lithography. While gravure printing was particularly well-suited to printing large quantities of standardized forms, no gravure paper comparable to the JCP-A80 paper (approved for data-collection use by GPO, the National Archives and Records Administration, and the Census Bureau) was available.⁷⁷

Quality Assurance for Printing Operations

The quality assurance (QA) process for printing questionnaires and other public-use forms was extensive and incorporated manual and automated components. The QA program included three phases: pre-award, prior-to-production, and production.

⁷⁶ U.S. Census Bureau, untitled table of printing contracts, contractors, and billings from Census 2000, Aug. 2, 2004; *Ibid.*, "Components of Printing Contracts in Census 2000" (Draft), Chapters 2-5.

⁷⁷ Oliver, "Profile of the Census 2000 Printing Quality Assurance Program," p. 7.

Pre-award QA. GPO led the pre-award phase by assessing the capacity of prospective contractor's production facilities and expertise to accomplish the terms of the various printing contracts within the time allowed. GPO required prospective bidders to submit ink and paper samples and, following this process, the printing companies then provided samples of print runs to GPO for approval.

GPO gave contractors that satisfied these requirements 1 week from the time of contract award to submit their own QA plans that included such elements as a flow chart illustrating each step in the production process (including subcontractors' steps), proposed start dates and duration of all phases of production, coordination of the production process, storage and shipping of the completed products, and the replacement of spoiled or destroyed mailing packages. In addition, GPO required successful bidders to provide plans assuring that all addresses and census identification numbers and the related bar codes were accurately and completely printed on census forms, that document integrity bar codes were correct, that the production process included measures to control dust and loose paper fibers, and that the production process incorporated procedures allowing for the removal of defective questionnaires and for resuming production at the proper place.

Within 2 weeks of awarding the printing contracts, the Census Bureau and GPO held post-award meetings with the printing companies to review all aspects of the contractors internal and external operations.⁷⁸

Prior-to-production QA. The Census Bureau organized the QA process for prior-to-production samples. The agency's Bowie computer center, in conjunction with RITRC, tested both short (D-1) and long (D-2) forms for physical dimensions, color and black densities, color values, and bar code verification. Measuring tools used included gauges, densitometers, spectrophotometers, and bar code verifiers. The USPS provided the gauges, which read and verified postal bar codes. Densitometers measured optical density; the resulting measurement depended on the darkness of printed material. Spectrophotometers measured the consistency of color across a printed area. Bar code verifiers were scanning instruments that optically read specific print quality components of bar codes and verified their machine readability. While the Census Bureau was generally satisfied with the quality of the forms tested, a number of deficiencies were identified, including image position, ink density, dust buildup in the scanners, and color attributes. None of the forms failed the bar code verification test or the dropout color test. The Census Bureau also put a random sample of D-1 mailing packages through a series of tests to assess check-digits, bar codes, and envelopes at the agency's Baltimore DCC. Test runs of the D-1 packages through the Baltimore DCC's sorters were successful, as were similar tests of D-2 packages through sorters at the Lockheed Martin laboratory.

The NPC in Jeffersonville, IN, performed both visual and automated assessments. Among the problems identified by visual inspection were spots and extraneous marks, poor positioning of the document integrity bar code, poor image position, questionnaire damage, and density variation in the dark gold ink. Inspection by instrument revealed additional defects, such as color density failures and bar code errors.

While these deficiencies required monitoring, none were insurmountable, and the Census Bureau conditionally approved all the contractors tested.⁷⁹

Production QA. The Census Bureau developed and implemented an automated, integrated QA plan that included data provided by the printing contractors, agency experts assigned to the printer's facilities, and testing and evaluation by the NPC, DSSD, and RITRC. The Census Bureau coordinated its QA monitoring with GPO, which also maintained active, on-site inspection of facilities and print runs and provided technical support.

The inspection process usually involved contractor personnel pulling and examining samples from each step of the printing process performed on any given day at plants processing the major data-collection questionnaires. Census Bureau and GPO staff reviewed a subset of the contractor-drawn

⁷⁸ Ibid., pp. 11–12; U.S. Census Bureau, "Forms Design and Printing Lessons Learned for Census 2000," Census 2000 DSCMO General Memorandum Series No. 01-03, May 15, 2002, p. 6.

⁷⁹ Oliver, "Profile of the Census 2000 Printing Quality Assurance Program," pp. 11–16, 18.

samples and initiated their own independent inspections. The number of monitoring personnel varied according to the number of hours per day a given plant was operating, the complexity of the production process, and the importance of the product. For example, GPO and the Census Bureau each employed two monitors per day, each of whom worked a 12-hour shift, 7 days per week, at Webcraft's New Jersey plant that was printing the 40-page MO/MB long-form questionnaire. A similar work force monitored the same company's printing of the U/L long form. A larger contingent of three Census Bureau monitors and four GPO monitors, working 12-hour shifts, 5 days per week, checked the binding of the two 16-page signatures and one 8-page signature into the 40-page questionnaire and the insertion of the questionnaire, return envelope, and cover letter into the mailout envelope at the Direct Marketing Association's facility in Baltimore, MD. Less complex jobs required fewer monitors. Only one Census Bureau monitor and one GPO monitor were required for each 12-hour shift, 6 days per week, to check the printing of the short-form MO/MB questionnaires at the Communicolor plant in Hebron, OH. When on-site inspectors discovered defects, they generally reported them to the GPO monitor, who served as middleman between the Census Bureau and the contractors.⁸⁰

Each production day, the contractors sent production samples to the NPC for thorough inspection. DSSD staff analyzed the NPC data and provided reports to DSCMO. The inspection process during the production phase was similar to that employed in the previous phase but was more thoroughly automated through a system called Print Sample.

This automated data-collection and analysis system contained two components: a point-and-click interface that recorded the results of the visual inspections and a subsystem that recorded and analyzed readings taken by densitometer, spectrophotometer, and bar code verifier. The mouse-driven visual inspection component allowed a monitor to enter a pass or fail for each attribute inspected and to characterize the importance of the defect. The Print Sample software also captured the density, spectral, and bar code readings that QA staff took of the sample questionnaires and compared the readings to the specifications contained in the relevant contract. An NPC contractor developed the Print Sample visual inspection software, while RITRC devised the reading inspection component.⁸¹

During the production of public-use forms, QA data from contractors, Census Bureau and GPO monitors, and the NPC team contributed an average of about 50,000 visual inspections per day. Instrument-aided color inspections added another 50,000 inspections each day. Despite the large data storage and retrieval requirements, Census Bureau staff determined that it was necessary to save information pertaining to both passing and failing color measurements to be able to track trends in product quality. In late 1998, the Census Bureau hired Advanced Engineering and Research Associates to build and manage the Quality Information System for Printing (QuISP), an Internet-based database system to receive, store, analyze, and disseminate statistics on the printing of public-use forms for Census 2000 and on the associated QA system. QA technicians stationed at the various printing plants inspected printed forms, recorded measurements in Print Simple, and transferred the results to the QuISP via the World Wide Web. The QuISP system produced summary statistics, such as average defects per hundred printed items, daily average defects by printing location and from NPC inspection, and cumulative and moving average defects by data source.⁸²

Printing error in the advance letter. While the QA system worked quite well overall in monitoring and maintaining the quality level of the public-use forms used during Census 2000, one significant defect did pass through the system without being detected. The advance letter sent to about 115 million addresses contained an extra digit printed in front of the street address. This extra digit was not incorporated in the postal bar code, so the sorting machines that read addresses from the bar codes were not affected, and the mail was sorted properly. The USPS

⁸⁰ Ibid., pp. 17–19; U.S. Census Bureau, “Forms Design and Printing Lessons Learned for Census 2000,” Census 2000 DSCMO General Memorandum Series No. 01-03, May 15, 2002, pp. 17–22, 26–27; and Joseph D. Conklin, “Trip Report to Communicolor in Hebron, OH,” DSSD Census 2000 Procedures and Operations Memorandum Series No. G-17 pp. 1–4.

⁸¹ Oliver, “Profile of the Census 2000 Printing Quality Assurance Program,” pp. 19–20.

⁸² Ibid., pp. 20–23.

alerted all local post offices to inform postal carriers of the problem; the USPS also assured the Census Bureau that this data processing and printing error would not affect delivery of the advance letter to all the appropriate addresses in the country. A Census Bureau evaluation of the delivery of the advance letter indicated that the USPS delivered the mislabeled letters to the correct addresses between 92 and 95 percent of the time.⁸³

Mailing Piece Addressing and Delivery

The Census Bureau worked closely with GPO, the USPS, and its printing contractors to implement the printing, shipping, and delivery schedules for census questionnaires and other printed materials. The Census Bureau planned for the USPS to deliver three waves of communications to mailing addresses across the United States according to the following schedule:

Type of mailing piece (for mailout/mailback)	Begin delivery	End delivery
Advance letter	March 6, 2000	March 8, 2000
Questionnaire	March 13, 2000	March 15, 2000
Reminder card	March 20, 2000	March 22, 2000

In addition, the agency planned for the USPS to deliver advance letters and reminder cards to mailing addresses in the U/L mailing universe, while Census Bureau personnel would deliver the questionnaires themselves. The schedule for these operations is shown below:

Type of mailing piece (for update/leave)	Begin delivery	End delivery
Advance letter	March 1, 2000	March 3, 2000
Questionnaire	March 3, 2000	March 30, 2000
Reminder card	March 27, 2000	March 30, 2000

As a result of close coordination among the contributing organizations, the Census Bureau adhered to this schedule for delivering mailing packages for Census 2000.⁸⁴

The printing process for most of the questionnaires in the MO/MB universe was driven by the availability of the decennial master address file (DMAF). The Census Bureau sent the bulk of the address file to the printing companies in the fall of 1999. However the contracts required that these companies perform a series of intermediate steps between the contract award in late 1998 or early 1999 and the mailout in March 2000. Only after the printing of several runs of test forms and their review and acceptance by Census Bureau and RITRC staff were the printers allowed to begin printing the actual questionnaires to be used in Census 2000.⁸⁵ For example, Communicolor was awarded the contract for printing the short form MO/MB questionnaire in December 1998. Post-award test printing runs and their review extended from January through mid-May 1999. Questionnaire printing began in June 1999. The Census Bureau sent address files to Communicolor in September and October 1999, followed by the late additions to the address file in early February 2000. Printing of the long-form MO/MB questionnaire followed a similar schedule. The contractor, Webcraft Technologies, won the contract in December 1998, produced test printing runs between January and April 1999, then began printing long-form questionnaires in May 1999. The Census Bureau sent address files in September and October 1999 and an additional file of late adds in February 2000.⁸⁶

⁸³ U.S. Census Bureau, "GPO Statement on Census Advance Letters," February 26, 2000; U.S. Census Bureau and U.S. Postal Service, "Census Letters: Right Address, Wrong Numbers," February 26, 2000; before the U.S. House of Representatives, Subcommittee on the Census, Committee on Government Reform, "Prepared statement of Kenneth Prewitt, Director, U.S. Census Bureau," March 8, 2000; U.S. Census Bureau, Planning, Research, and Evaluation Division, "Census 2000 Advance Letter Evaluation," March 31, 2000.

⁸⁴ U.S. Census Bureau, "Census 2000 Mailing and Questionnaire Delivery Strategy and Dates," Census 2000 Decision Memorandum No. 76, March 2, 1999; Sharon K. Boyer, "Questionnaire Printing, Addressing, Assembly, and Distribution Operations Assessment Report (Draft)," October 19, 2001, p. 11.

⁸⁵ See, for example, the printing and delivery schedule for the English-language long-form mailing packages in *Commerce Business Daily Online*, Sept. 21, 1998, pp. 19–20.

⁸⁶ U.S. Census Bureau, "Contracts Deliverables Schedules," April 27, 1999.

Questionnaire printing was generally a three-stage process. The initial printing step involved unwinding the paper from a large roll onto torsion rollers, applying ink to both sides of the paper, heating the paper to dry the ink, moistening the paper to prevent brittleness, and winding the printed questionnaires onto a take-up roll. At this stage, the printer reproduced the questionnaires without knowing the addresses to which the questionnaires were to be delivered. As a result, this step was largely completed before the Census Bureau finished creating the DMAF in the fall of 1999. Once the DMAF was created, the Census Bureau sent copies to the printers and the next step could begin. The printed questionnaires were unwound from the take-up roll, a mailing address was printed on each questionnaire, as well as a census identification code number, its associated bar code, and the appropriate postal delivery bar code. Both numerical and bar codes had to be visible through the address window on the outgoing envelope. Then the forms were folded, edges trimmed, and placed in boxes and shipped to the bindery.

The third step in the process—inserting the questionnaire, a cover letter, and a return envelope into the mailout envelope—was often subcontracted by the printing company. After the questionnaires, cover letters, and return envelopes were placed in separate stacking towers, an outgoing envelope was moved into position, opened by a mechanical arm or forced air, and a questionnaire, cover letter, and return envelope were inserted. The adhesive on the outgoing envelope was then moistened, and the envelope sealed and ready for preparation for mailing.⁸⁷

The USPS worked closely with the Census Bureau and individual printing contractors to develop load plans detailing when and where the USPS was to pick up the mailing pieces, the number of trucks to be used, the frequency of their arrival, and the loading order. Mailing packages that were bound for the farthest destination were picked up first, while those with addresses that were closer to the print contractors warehouse were among the last to be loaded. Print contractors were responsible for loading the envelopes into trays organized by state, three- or five-digit ZIP Code, and by carrier route where possible. The trays were stacked on pallets, which were shrink-wrapped and prepared for pickup by USPS tractor-trailers.⁸⁸

Advance letter. Moving the mailing packages from the printers warehouse through the mail stream to the recipients' addresses involved a logistically complex series of steps. The USPS provided the print contractor of the advance letter (Freedom Graphics) with the ZIP Code sortation, palletization, and warehousing arrangements that had the most efficient load plan for the mailing. USPS tractor-trailers picked up the advance letters and transported them to postal installations—also called sectional center facilities—that distribute mail in geographic areas covered by the first three digits of one or more ZIP Codes. These sectional facilities held the pallets until all the shipments in the United States were distributed. Then, the advance letters were sent to local post offices so that postal carriers could deliver them between March 1 and 3, 2000, in U/L areas and between March 6 and 8, 2000, in MO/MB areas.⁸⁹

Questionnaires. Mailing arrangements for the short and long questionnaires were similar to those for the advance letter. The USPS gave the printing contractors sorting and palletizing instructions designed for efficient distribution through the postal system. Mailing packages of each form were transported to bulk-mail facilities and/or processing and distribution centers, where they were held for release to local post offices in time to be delivered to residential addresses between March 13 and 15, 2000.

The USPS considered the short form as a “letter” mailing piece; postal regulations allowed bulk mailers to palletize the short-form mailing packages in preparation for staging and mail delivery. However, the USPS classified the long form as “flat mail” and postal regulations did not allow for

⁸⁷ Oliver, “Profile of the Census 2000 Printing Quality Assurance Program,” pp. 2–3.

⁸⁸ U.S. Census Bureau, “Census 2000 Operational Plan,” December 2000, pp. V-15–16; U.S. Census Bureau, “Program Master Plan: United States Postal Service Participation in Census 2000 (Draft),” n.d., pp. 3–4.

⁸⁹ U.S. Census Bureau, “Program Master Plan: United States Postal Service Participation in Census 2000 (Draft),” n.d., p. 4.

palletizing flat mail. After discussions with the Census Bureau, the USPS modified its regulations to permit the palletization of census long forms. This modification made the transportation, distribution, and delivery of the long forms easier for the postal service and helped ensure their timely delivery to nearly 15 million addresses.⁹⁰

Reminder card. The reminder card thanked respondents who had returned their questionnaires for their cooperation and reminded other respondents that it was not too late to complete and return the forms. The cards were printed and addressed in Green Bay, WI, and were prepared for mailing in accordance with sorting and palletizing plans the USPS provided to the printer. Like the advance letters and the questionnaires in MO/MB areas, most reminder cards were sent via first-class mail; however those delivered to housing units in U/L areas were sent via Standard A (third-class mail). Between March 20 and March 22, 2000, the USPS delivered over 94 million reminder cards in MO/MB areas. In U/L areas, the USPS delivered over 23 million reminder cards in the March 27 to 30, 2000, period.⁹¹

⁹⁰ U.S. Census Bureau, "Forms Design and Printing Lessons Learned for Census 2000," Census 2000 DSCMO General Memorandum Series No. 01-03, May 15, 2002, p. 19; U.S. Census Bureau, "Program Master Plan: United States Postal Service Participation in Census 2000 (Draft)," n.d., pp. 4–5.

⁹¹ U.S. Census Bureau, "Program Master Plan: United States Postal Service Participation in Census 2000 (Draft)," n.d., p. 5; U.S. Census Bureau, "Census 2000 Mailing and Questionnaire Delivery Strategy and Dates," Census 2000 Decision Memorandum No. 76, March 2, 1999.

Chapter 9.**Data Products and Dissemination**

PREPUBLICATION DATA FILES	399
AMERICAN FACTFINDER (AFF)	401
Building on the Data Dissemination Innovations of the 1990 Census	401
Early Work on the Development of an Internet-Based Data Delivery System	402
Vision and Guiding Principles for Developing the System.	402
Early Internal and External Customer Input	403
Development of the First Prototype—DADS96.	404
Additional Solicitation of User Input and Ongoing Consultative Work	404
Beta Testing of the Second Prototype—DADS97.	404
Decision to Contract Out Further Development and Implementation of DADS	405
State Data Center Review of DADS97 Prototype.	405
DADS98/AFF98 Development Process	405
AFF98 Production.	406
AFF2000.	406
Costs to Develop and Implement AFF	407
Evaluation of AFF	408
Innovations and Improvements for the Future.	409
PRINCIPAL DATA PRODUCTS.	409
Census 2000 Data Product Review.	409
Census 2000 Gateway Web Page.	411
Redistricting Data Program.	412
Background	412
Legal issues relating to the redistricting data	412
Development and implementation of the Redistricting Data Program	413
Demographic Profiles.	415
Housing Unit Counts	415
Race and Hispanic or Latino Summary File	415
Summary Files 1 and 2	415
Summary Files 3 and 4	416
Tables	417
American Indian and Alaska Native Summary File	417
Congressional District and State Legislative District Summary Files	417
Congressional District Data Summary Files	417
State Legislative District Summary Files	418
Printed Reports (PHC Series)	418
<i>Summary Population and Housing Characteristics</i> (PHC-1)	418
<i>Summary Social, Economic, and Housing Characteristics</i> (PHC-2)	418
<i>Population and Housing Unit Counts</i> (PHC-3)	418
<i>Social, Economic, and Housing Characteristics—</i> <i>Island Areas</i> (PHC-4)	418
<i>Characteristics of American Indians and Alaska Natives by Tribe and</i> <i>Language: 2000</i> (PHC-5)	419
Other Reports	419
Census 2000 Briefs	419
Census 2000 Special Reports	419
Other Tables	419
Census 2000 PHC-Ts	419
Microdata	419

CONTENTS

GEOGRAPHIC PRODUCTS	420
Background: Product Planning and Technological Developments	420
Geographic Products Pertaining to the Redistricting Data Program	421
Redistricting TIGER/Line® files	421
Redistricting map products	421
Other TIGER® Extracts and Map Products	422
Census 2000 TIGER/Line® files	422
Census 2000 boundary files	422
Census 2000 block and tract relationship files	422
Census 2000 block maps	423
Census 2000 tract maps	423
American Indian tribal census tract outline maps	423
Census 2000 county and county subdivision outline maps	424
Census 2000 urbanized area (UA) and urban cluster (UC) outline maps	424
Congressional district products	424
Public use microdata area (PUMA) maps	424
1990 census small area maps (re-created)	425
Map Products Pertaining to Characteristic Data	425
Census 2000 population profile maps	425
<i>Mapping Census 2000: The Geography of U.S. Diversity</i>	425
American Indians and Alaska Natives in the United States map	425
Population center and population distribution maps	426
<i>Census Atlas of the United States</i>	426
DATA PRODUCTS PERTAINING TO SPECIAL POPULATIONS	426
Operation and Methodology	426
Original Plans for the Dissemination of SBE Data	427
Change to the Original Plans for the Dissemination of SBE Data	428
Responses to the Census Bureau Decision	428
Data Products on the Emergency and Transitional Shelter Population	429
GAO Releases Report Evaluating the SBE	429
Census Bureau Response to GAO Report	430
Implications for the 2010 Census	430
SPECIAL TABULATIONS PROGRAM	431
Authorization	431
Program Summary	431
Special Tabulations of General Interest	432
Change in Policy Governing Special Tabulations and Extracts	433
COUNT QUESTION RESOLUTION PROGRAM	434
Scope of the Program	435
Results of the Program	435
MARKETING, USER SERVICES, AND DISSEMINATION	436
Marketing Services Office	436
Customer Liaison Office	436
State and Governmental Programs	436
Non-Governmental Programs	437
ARCHIVING OF DATA PRODUCTS AND RELATED RECORDS	438
Archiving of Census 2000 Data Products and Detail Files	438
Archiving of Individual Census Records From Census 2000	439
Background	439
Discussions regarding Census 2000 records early in the decade	439
Award of data capture contract for Census 2000	440
Agency work to finalize Census 2000 archival requirements	440
Scheduling and appraisal of the digital image files from DCS 2000	441
Comments regarding proposed schedule for the image files	442
Initial appraisal reversed; digital images scheduled as permanent records	442
National Archives Assembly urges archivist to reconsider his decision	443
Archivist responds to assembly; images to be converted to microform	443
Census Bureau enlists contractors to complete archiving work	444

Chapter 9: Data Products and Dissemination

PREPUBLICATION DATA FILES¹

The official data products² discussed in this chapter were produced from two Census 2000 prepublication data files: the 100 percent detail file (HDF) and the sample edited detail file (SEDF). The HDF was the source file—directly or indirectly—for the redistricting data (also known as the Public Law [P.L.] 94-171 data), Summary Files 1 and 2, and all the other 100 percent data products (so called because these data were derived from the questionnaire items asked of all respondents and at all housing units). Similarly, the SEDF was the source file for Summary Files 3 and 4, the public use microdata sample (PUMS) files, and all the other sample data products (the data for these products were obtained from responses to the long-form questionnaire, which was distributed to a sample of the population and housing units).³ The creation of these detail files is described in Chapter 6, “Data Capture and Processing.”

In addition to these two detail files, the Census Bureau also created a 100 percent detail file that incorporated a “statistical adjustment.”⁴ This file was produced because the Census Bureau had planned that all 100 percent data products it produced, including the redistricting data, would incorporate a statistical adjustment of the census counts.⁵ Similarly, the Census Bureau planned to produce a sample detail file in which the sample data would have been weighted to the population totals in the 100 percent detail file that incorporated a statistical adjustment. Thus, preliminary plans indicated that all official Census 2000 data products would be produced from prepublication files that incorporated statistically adjusted data derived from the results of the Accuracy and Coverage Evaluation (A.C.E.) program.⁶

Significantly, the Census Bureau was obligated by the requirements of P.L. 105-119 (the U.S. Department of Commerce Fiscal Year 1998 Appropriations Act⁷) to produce an HDF that did not incorporate statistical adjustment. P.L. 105-119 required the Census Bureau to make publicly available “the number of persons enumerated without using statistical methods” for

¹ Prepublication files are those data files that were produced once all the respondent data were converted to electronic format and upon which a series of processing steps was undertaken. The prepublication files from which the data products were produced are the “detail” files, and these files are discussed in this section. The series of processing steps carried out on the initial response file and the intermediate prepublication files created are discussed in Chapter 6, “Data Capture and Processing.”

² The apportionment counts are not considered a data product. Delivery of the Census 2000 apportionment counts and the resulting apportionment of House representatives among the states are discussed in the “Legal Authority” section of Chapter 1, “The Context of Census 2000.”

³ For more information regarding the content of the Census 2000 short- and long-form questionnaires, see Chapter 3, “Population and Housing Questions.”

⁴ This process involved dual system estimation, in which a sample of households was surveyed contemporaneously with the census and then matched to the census to estimate those missed or erroneously counted in the enumeration. For a detailed discussion of the methodology, see the “Accuracy and Coverage Evaluation” section of Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

⁵ Department of Commerce, “Updated Summary: Census 2000 Operational Plan,” February 23, 1999. Under the Census Bureau’s original plan for Census 2000—which is discussed in detail in Chapter 2, “Planning the Census”—the production of the apportionment data also would have incorporated a statistical adjustment. However, the Supreme Court ruled in *Department of Commerce v. U.S. House of Representatives* (119 S.Ct. 765 (1999)) that the use of statistical sampling (and thus statistical adjustment based on sampling) to produce the state population numbers for apportionment of the U.S. House of Representatives was precluded by Section 195 of the Census Act (Title 13, U.S. Code). See “The Debate Over the Use of Sampling” section of Chapter 11, “Legal Issues,” for more information regarding the challenges to the planned uses of sampling in Census 2000.

⁶ The A.C.E. program is discussed in Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs.”

⁷ For background information regarding the relevant provisions of P.L. 105-119, see the “Legislation” section of Chapter 11, “Legal Issues.”

. . . (2) the data contained in the 2000 decennial census Public Law 94-171 data file released for use in redistricting, (3) the Summary Tabulation File One (STF-1) for the 2000 decennial census, and (4) the official populations of the States transmitted from the Secretary of Commerce through the President to the Clerk of the House used to reapportion the districts of the House among the States as a result of the 2000 decennial census.⁸

Subsequent to the release of the February 1999 Operational Plan, the Department of Commerce defined a decision-making process for determining whether official redistricting data should incorporate a statistical adjustment.⁹ In keeping with that process, on March 1, 2001, based on the report of the Executive Steering Committee for A.C.E. Policy (ESCAP),¹⁰ the Director of the Census Bureau concurred with and adopted the committee's recommendation that the unadjusted data be designated as the official redistricting data.¹¹

Using the 100 percent detail file that incorporated a statistical adjustment, Census 2000 adjusted block-level data had been prepared in the event the Secretary of Commerce decided in favor of adjustment. These data were available for release to states and localities within the deadline stipulated in P.L. 94-171 (within 1 year following the decennial census date). On March 6, 2001, Secretary of Commerce Donald L. Evans announced his determination, based on the ESCAP report and the Census Bureau Director's recommendation, that the unadjusted data would be the official redistricting data.¹² Thus, the unadjusted data were the only data released to the public. The Secretary stated that the release of the adjusted data would be considered at a later time following the ESCAP's further investigation.¹³ As a result of this decision, the Census 2000 adjusted block-level data were the subject of Freedom of Information Act (FOIA) requests and litigation.¹⁴

In addition to the report and recommendation about potential adjustment of the redistricting data, ESCAP also was required to make a separate recommendation to the Director regarding the use of the adjusted data for nonredistricting purposes, including the data's incorporation in the Census 2000 sample data products, postcensal (intercensal) estimates (and thus their use in annual intercensal federal funding allocations), and survey controls. ESCAP issued its report recommending against the use of the adjusted data for these purposes on October 17, 2001.¹⁵ This second round of research and analyses was dubbed "ESCAP II."

Following adoption of ESCAP's recommendation against adjustment, the Census Bureau's Acting Director informed the Commerce Department's Under Secretary for economic affairs that the Census Bureau would release Census 2000 sample data products, intercensal estimates, and survey controls using unadjusted data.¹⁶ Thus, the data in the SEDF were weighted to the population totals in the HDF (without statistical adjustment). Following this second adjustment decision, the Department of Commerce/Census Bureau continued to withhold the adjusted block-level data because of documented concerns regarding the data's accuracy.

⁸ P.L. 105-119, Title II, Section 209(j).

⁹ The original rule defining the decision-making framework and the subsequent rule (superceding the earlier rule), promulgated by the new administration in February 2001, are discussed in "The Debate Over the Use of Sampling" section of Chapter 11, "Legal Issues."

¹⁰ ESCAP was a committee of senior Census Bureau officials charged with making a recommendation to the Director regarding whether the official redistricting data should incorporate a statistical adjustment.

¹¹ *Federal Register*, Vol. 66, No. 46 (March 8, 2001), p. 14004.

¹² The Secretary announced his decision at a March 6, 2001, news conference and documented it in a March 7 memorandum. See *Federal Register*, Vol. 66, No. 49 (March 13, 2001), pp. 14520-21. The ESCAP report and recommendation, and the Secretary of Commerce's decision are discussed elsewhere in more detail, see especially "The Debate Over the Use of Sampling" section of Chapter 11, "Legal Issues."

¹³ Transcript of press conference on Census 2000 redistricting data, held at the U.S. Department of Commerce, March 6, 2001, Federal News Service, Washington, DC, p. 2.

¹⁴ These events are discussed in detail in the relevant sections of Chapter 11, "Legal Issues."

¹⁵ *Federal Register*, Vol. 66, No. 214 (November 5, 2001), pp. 56006-21. The ESCAP research and analyses relating to possible nonredistricting uses of the adjusted data are discussed in the "Accuracy and Coverage Evaluation" section of Chapter 10, "Testing, Experimentation, Evaluation, and Coverage Measurement Programs."

¹⁶ *Ibid.*, p. 56006.

As a result of the above-referenced litigation, the Census Bureau was ordered to release the adjusted block-level data under the FOIA.¹⁷ Following the court order, the Census Bureau anticipated additional requests for the adjusted data. Consequently, the agency developed a process for providing these data to requesters. Requesters were required to acknowledge receipt of a caveat that stated, in part:

... the adjusted estimates were determined to be so severely flawed that all potential uses of these data would be inappropriate. Accordingly, the Department of Commerce deems that these estimates should not be used for any purpose that legally requires use of data from the decennial census and assumes no responsibility for the accuracy of the data for any purpose whatsoever. The Department, including the Census Bureau, will provide no assistance in the interpretation or use of these numbers.¹⁸

AMERICAN FACTFINDER (AFF)

AFF is the Census Bureau's Internet-based system that enables the agency to provide data quickly to a wide spectrum of data users.¹⁹ AFF's objective is to provide a single electronic system for data access, dissemination, and inquiry that both internal and external customers can use. AFF currently disseminates data produced by the Census Bureau's decennial, demographic, and economic program areas.²⁰ In addition, AFF is the Census Bureau's online mapping tool and complies with directives, mandates, and standards established by the Federal Geographic Data Committee for the dissemination of geographic data.

In addition to the obvious benefits of better interaction, service, and response time for users, the Census Bureau believes that AFF also: (1) encourages cooperation from census and survey respondents as a result of data users/customers becoming more familiar with Census Bureau data and the data's value and (2) serves as indirect "advertising" for the agency's products and services and thus increases public awareness of them.

This section discusses the development of AFF and its Census 2000-related functionalities that provide users with access to a voluminous amount of data and the ability to utilize those data in a variety of ways and formats. The principal data products and geographic products from Census 2000 are discussed in the next sections of this chapter.²¹

Building on the Data Dissemination Innovations of the 1990 Census

With the rapid advance of digital technology, the Census Bureau was able to develop AFF in response to frequent complaints that the agency's past decennial census data products were not easy to use or released in a timely manner. One of the most significant obstacles many users faced in accessing and working with decennial census data in the past was that even with access to a computer, users often lacked the random access memory (RAM), computing power, and specialized software required to load and manipulate an entire summary tape file (STF)²² on magnetic tape. In addition, they most often wanted only a portion of an electronic file. These users often obtained extracts from secondary data disseminators who purchased decennial census products from the Census Bureau and provided extracts as a for-profit enterprise.

¹⁷ *U.S. Department of Commerce v. Carter*, 307 F.3d 1084 (9th Cir. 2002). See the "Litigation" section of Chapter 11, "Legal Issues," for detailed information about this lawsuit.

¹⁸ U.S. Census Bureau, "Requests for Adjusted Data from Census 2000," memorandum for executive staff and all divisions, from Preston Jay Waite, Associate Director for Decennial Census, December 6, 2002 (attachment).

¹⁹ American FactFinder is accessible on the Census Bureau's Web site at <<http://www.factfinder.census.gov>>.

²⁰ The dissemination of decennial census data from the AFF includes data from the ongoing American Community Survey, which is part of the decennial program for 2010.

²¹ Data products pertaining to Puerto Rico and the Island Areas are discussed in Chapter 12, "Puerto Rico and the Island Areas."

²² In connection with the 1990 census, the Census Bureau released four STFs containing 100 percent data or sample population and housing data. These files were made available on computer tape and other media.

While the 1990 data products included the summary and other tape files, which contained more than 270 gigabytes of data, and some 800 printed reports, which comprised more than 1.85 million pages,²³ the Census Bureau also released 1990 census data on CD-ROMs, and specialized software facilitated the extraction of STF and public use microdata sample (PUMS) data from the discs.²⁴ These innovations increased the accessibility and ease of use of decennial census data.

Early Work on the Development of an Internet-Based Data Delivery System²⁵

In the early 1990s, the Census Bureau began exploring ways to use the emerging “information superhighway,” now generally referred to as the Internet, to interact with the public and serve its customers. In September 1993, Vice President Al Gore released the National Performance Review report which, among other things, contained a series of recommendations relating to the electronic availability of Census Bureau data. Among the recommendations was a call for uninterrupted access to computerized data stores, including large databases of statistics from censuses, surveys, estimates, and international data sources, among many others, via the Internet.²⁶

To undertake the early developmental work for the Internet-based data dissemination system, the Census Bureau formed a working group composed of three teams. Each was responsible for a distinct aspect of the program development plan.

- **The Technical Development Team** was responsible for conducting research and procuring technical support, hardware, and software for the development of the system. This team later designed and developed (with contractor assistance) the initial system prototypes in 1996 and 1997.
- **The User Requirements Team** facilitated the identification of user and technical requirements and led outreach and promotion activities, such as presentations, seminars, etc. It was also responsible for planning and evaluating the testing of the prototypes as they became available.
- **The Internet Support Team** was tasked with establishing an Internet or World Wide Web site for the agency and then later “integrating” the Web site with the various iterations of the data dissemination system.

In 1994, the Internet Support Team established the Census Bureau’s Web site, which received a Hammer Award, the U.S. Vice President’s special recognition for improving government operations. The Web site quickly proved to be a cost-effective means of disseminating large sets of aggregate data and microdata, organizational information, publications and analyses, software products, and custom software applications. However, this was still a far cry from a data dissemination system with numerous functionalities, including allowing the user to produce custom extracts with a few keystrokes or to direct the system to present data in graphic (charts, graphs) or mapping formats.

Vision and Guiding Principles for Developing the System²⁷

In May and June of 1995, the Census Bureau held a series of roundtable discussions to support the work of the three teams. Event participants were staff from various directorates across the

²³ About 90 percent of the 1990 census data products were available in hard-copy (printed report) format. See Titan Systems Corporation/Systems Resources Division, “American FactFinder System Requirements Study,” Census 2000 Evaluation No. R.3.b., June 6, 2002, p. 1.

²⁴ “Go” software provided the capability to extract individual tables from the STFs. “QuickTab” software enabled users to extract data from the PUMS files based on record and item selection criteria and to generate frequency counts and cross-tabulations.

²⁵ The information in this section is summarized from U.S. Census Bureau, “Program Master Plan: Census 2000 Decennial Dissemination and Inquiry System,” Census 2000 Informational Memorandum No. 35, December 13, 1999, pp. 4–5.

²⁶ Other recommendations included the simultaneous publishing to the Internet of electronic copies of printed reports; providing online access to microdata samples (such as PUMS or similar files) from censuses and surveys; connecting the Census Bureau’s regional offices to such systems; and leveraging the state data centers (SDCs) and their local data affiliates to expand the public’s access to these systems. See U.S. Department of Commerce, “National Performance Review Information,” memorandum for Economics and Statistics Administration senior staff, Everett M. Ehrlich, special adviser to the Secretary, September 8, 1993, pp. 1–2.

²⁷ The information in this section is summarized from “Program Master Plan: Census 2000 Decennial Dissemination and Inquiry System,” pp. 3–5 and Attachment 1.

agency, and the purpose was to (1) lay the foundation for a communication process that would encourage Census Bureau-wide participation in the design and development of the system and (2) develop an initial vision and set of principles that would guide the system's design and development.

The discussions produced a preliminary vision statement and a list of principles. The vision statement indicated that Census 2000 and the continuous measurement program (now known as the American Community Survey [ACS]) would be the initial focus of the system, and the system would have to be implemented in time to be the vehicle for disseminating data from these programs. In other words, the system would have to be fully tested during the 1998 Dress Rehearsal operations and be fully operational by early 2001 (for dissemination of the Census 2000 data, beginning with the redistricting [P.L. 94-171] data in March 2001). The statement noted that other data sets with similar geographic detail (economic census files, population estimates files, etc.) also would be included in the system.

Among the guiding principles were the following:

- Make the system accessible to the widest possible array of users through the Internet and available intermediaries such as the state data centers (SDCs) and local data affiliates.
- Build disclosure protection into the design of the system.
- Make geography the integrating principle for the data.
- Build the system to be a more cost-effective data dissemination program than the traditional publication program, and use the savings that result to educate users and potential users about how to obtain the data they need.
- Make use of related in-house work already completed or planned to ensure a coordinated, corporate approach to development of the system.
- Seek participation from both internal and external experts in the design and development of the system.

The discussions also produced suggestions for identifying user and technical requirements and related policy issues. The discussants agreed on the importance of identifying and resolving, early in the process, any technical concerns and policy issues that could be possible barriers to development of the system as envisioned. Finally, the participants stressed the importance of soliciting customer input in designing the system.

Early Internal and External Customer Input²⁸

The Census Bureau facilitated 12 focus group meetings in the fall of 1995 in part to implement the roundtable recommendation to include customer comments as an integral part of the development process. These meetings solicited and collected information that might be useful in developing user requirements. Meeting participants included internal and external customers who represented a cross-section of the Census Bureau's data user community. A standard set of 25 questions, covering topics such as user access, product types, output media, geography, and confidentiality, was asked of each group. The Census Bureau identified three categories each of internal and external customers. The categories and their definitions are not discussed here, but it is significant that this research involved the Census Bureau in an effort to categorize users according to the tasks they performed with the data. The importance of this work to the development of the system was later reinforced by consultative work performed by Dr. Ben Schneiderman of the University of Maryland's Human-Computer Interaction Laboratory. Dr. Schneiderman's work is discussed later in this section.

Using lists of responses to the 25 questions, the Census Bureau developed frequency matrices for the internal and external customer categories to identify common and unique needs and themes. With regard to overall system functionality, the common needs identified included that the system

²⁸ Ibid., pp. 6–7.

should (1) be simple to use and support print-on-demand, (2) provide online help and training, and (3) inform users prior to transmission about file size and download time for receiving requested electronic products. The focus groups also revealed that users, collectively, desired a range of product types: (1) predefined products and services, (2) simple user-defined products, and (3) complex user-defined products.

Development of the First Prototype—DADS96²⁹

Work on the first prototype of the Data Access and Dissemination System (DADS)—as it was then called—began in March 1996 and was completed in September of that year. In concert with Oracle Corporation, the Technical Development Team developed the prototype. The prototype successfully provided a “proof of concept” for the basic design, technology, and functionality envisioned for American FactFinder. Beginning with this prototype, the Census Bureau and its contractors used, in designing and implementing the system, a widely recognized structured approach to engineering systems in a data processing and warehousing environment called CASE*Method. “CASE” stands for computer-aided systems engineering and consists of seven basic stages: strategy, analysis, design, build, user documentation, transition, and production. The agency used a modified version of this approach beginning with development of DADS98 (see below).

The DADS96 prototype used a data warehouse structure and contained the following census data: 1990 census 1 percent and 5 percent PUMS files and STF 3 (sample data).

Additional Solicitation of User Input and Ongoing Consultative Work³⁰

The 1997 National Conference on Census Partnerships, organized by the Census Bureau, was held in May of that year. The conference was intended to inform local governments, nonprofit organizations, and community groups about the Partnership Program for Census 2000 and to involve these entities in promoting the census. In addition to providing information, the agency used the forum to obtain information from these groups regarding their data needs so that it could better educate them about how an electronic data dissemination system would enhance their use of census data. Through this conference, the Census Bureau opened an ongoing channel of communication to inform these entities about its progress in developing DADS and to continue to solicit their input regarding its functionalities.

As noted above, the Census Bureau enlisted the services of Dr. Ben Schneiderman to obtain expert advice regarding the development of DADS. In June 1997, Dr. Schneiderman recommended that the Census Bureau develop profiles of its users that focused on how they used census data and said that the agency needed to understand the differences between tasks performed only by certain user communities and those common to all users. He noted that this information would inform the design process and help define user requirements. Dr. Schneiderman further recommended that the Census Bureau use the profiles to design a system interface that met varying user group needs by providing task-related gateways to the data products. Additionally, the user profile and task information could provide possible benchmarks for usability testing, which was a key component of the DADS development process.

Beta Testing of the Second Prototype—DADS97³¹

Work on the second prototype began in October 1996,³² and the Census Bureau began beta testing the prototype in February 1997. Participants in the testing included representatives from the SDCs, Census Information Centers, 2000 Census Advisory Committee, government, academia, and the corporate world, including some representatives who had participated in DADS96 beta testing and the 1995 focus groups. Surveys of participants revealed four major problems:

1. The user interface was too difficult for novice users; that is, it assumed knowledge of census products/data.

²⁹ Ibid., pp. 2 and 7–8.

³⁰ Ibid., pp. 5–6.

³¹ Ibid., pp. 9–10.

³² Ibid., p. 2.

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2. The client-side personal computer requirements exceeded what most computer owners likely had at that time.
 3. System performance was unacceptably slow.
 4. Not enough system feedback was provided to the user.

Based on the beta testing results, the Census Bureau sought to improve the design process for the future DADS98 system. The Census Bureau focused on user interface design and client-side technology decisions, for instance targeting further development of the system for commonly used Web browsers.

Decision to Contract Out Further Development and Implementation of DADS

By this time, the Census Bureau had decided to contract out the further development and implementation of DADS, including the production system to be used for the dissemination of Census 2000 data. This decision was based on the realization that Internet technology was evolving rapidly and that those with the expertise to harness such technology would be needed to implement a continuously evolving, state-of-the-art system.³³ Thus, in April of 1997, the Census Bureau awarded the contract to IBM Global Services Corporation.³⁴ IBM completed the work on the DADS97 prototype and as the principal DADS contractor, was responsible for the systems architecture, design, data warehouse, and integration. A subcontractor, Environmental Systems Research Institute, Inc., was hired later to develop the mapping applications for the system.³⁵

State Data Center Review of DADS97 Prototype³⁶

Following the September 1997 release of DADS97,³⁷ the Census Bureau invited SDC representatives to agency headquarters for 6 weeks to review the prototype and to provide feedback regarding further development. In the DADS97 release, system functionality included, among other things, use of advanced Java software, thematic mapping, and the implementation of a metadata model. The data available to be accessed from the system included the content of DADS96, the 1990 census STF 1 (100 percent data), and the 105th Congressional District Data File.³⁸

As a result of the extensive feedback received from the SDC representatives, the Census Bureau endeavored to implement various changes/improvements to the system in subsequent releases, including:

- Aggregating and manipulating capabilities for summary file data.
- Disclosure protection in the advanced query tool (see below).
- An appropriate feedback mechanism for users to comment on the system.

DADS98/AFF98 Development Process³⁹

As opposed to the development process for DADS97, IBM's role was critical to the development of DADS98 from the outset of the process. From this point forward, the system was referred to as American FactFinder (AFF) and constituted a production system, in that it was used to disseminate the 1998 Dress Rehearsal data products and related geographic products.⁴⁰

In large part because of the quickly approaching deadline for putting the system into production, the Census Bureau and IBM utilized a revised version of their earlier development approach. Included in the new approach were multiple "short-build" iterations that involved designing, building, and testing various components until the entire system was assembled and integrated. This

³³ "American FactFinder System Requirements Study," p. 9.

³⁴ Ibid.

³⁵ U.S. Census Bureau News, "Census Bureau Touts New Data Delivery System," Press Release CB01-CN.57, February 26, 2001.

³⁶ "Program Master Plan: Census 2000 Decennial Dissemination and Inquiry System," pp. 10–12.

³⁷ Ibid., p. 2.

³⁸ Ibid.

³⁹ Ibid., pp. 12–13.

⁴⁰ Ibid., p. 2.

cyclical build process permitted continuous feedback and evaluation. At the same time, the Census Bureau worked on the design of the user interface by continuing to gather and refine user requirements. Designated points of contact facilitated these dual processes and participated in meetings with representatives from both areas to coordinate the work.

User requirements were solicited through numerous interviews with external users and with joint application design (JAD) sessions held in December 1997. (JAD sessions are a method of obtaining input for application development in which developers interact directly with future system users.) In the JAD sessions, the Census Bureau gathered and refined requirements from subject-matter experts working throughout the agency. In addition to the external user interviews and JAD sessions, DADS staff and IBM conducted user-requirements interviews with senior agency officials from November 1997 through January 1998.

Sixty external customer interviews were conducted with representatives from the SDCs, local governments, educational institutions, the media, and community organizations. The interviewees represented a cross-section of the Census Bureau's customers/data users, based on a user typology developed by the agency's Marketing Services Office.⁴¹ The interviews focused on task analysis, among other things, and enabled the IBM staff to understand how the interviewees "interacted" with and used census data. The results were used to validate and refine user requirements and help ensure that the system was user-centered as opposed to data-centered, and thus significantly influenced the development of the user interface design. In addition, specific features, such as the ability to sum data and calculate percentages, were added to the system design as a result of these interviews.

AFF98 Production⁴²

AFF98 was delivered in March 1999, in time to provide an Internet-based mechanism for the release of the redistricting data equivalent (that is, voting age, block-level data by race and Hispanic origin) from the dress rehearsal sites by the deadline stipulated in P.L. 94-171.⁴³ AFF98 also disseminated other dress rehearsal data products and related geographic products. This version of the system included an improved interface, improved mapping and integration of geographic components, and scalable systems architecture.

In addition to the content of DADS97, AFF98 also included 1997 economic census data products and data from the 1997 and the 1998 American Community Survey (ACS). The Census Bureau sought user feedback regarding this release and continued to make improvements to the system through the rest of 1999 and in 2000.

AFF2000

The version of the system used for Census 2000 data dissemination, AFF2000, was implemented in December 2000. It provided improved performance and system response times, incorporated revisions to the interface based on user feedback, was effectively integrated with the Census Bureau's Web site, and was scaled to accommodate the anticipated workloads associated with the release of Census 2000 data.⁴⁴

In addition to providing users with the full array of data products and tabulations from Census 2000—including data pertaining to Puerto Rico⁴⁵ and the Island Areas—AFF2000 continued to provide data from the ACS on an ongoing basis. Additionally, it incorporated the content of AFF98.⁴⁶

⁴¹ Ibid., p. 6.

⁴² Ibid., p. 2.

⁴³ To simulate census requirements, these dress rehearsal data were delivered within 1 year of Census Day. For the 1998 Dress Rehearsal, Census Day was April 18, 1998.

⁴⁴ "American FactFinder System Requirements Study," p. 3.

⁴⁵ A Spanish-language AFF interface was available for accessing data on Puerto Rico. "Program Master Plan: Census 2000 Decennial Dissemination and Inquiry System," p. 14.

⁴⁶ Data products and related geographic products from the Census 2000 Dress Rehearsal are no longer available on AFF.

AFF 2000 provided key functions for working with Census 2000 data products. With AFF 2000, users could:

- Extract and manipulate data from a variety of summary data files (for example, Summary Files 1 to 4).
- Create custom tables using tabulated data from other tables.
- Produce quick tables—table shells for obtaining population and housing characteristics in which the user designates the geographic area and population group.
- Produce geographic comparison tables⁴⁷—tables to compare population and housing characteristics across geographic levels of choice.
- Produce reference maps.
- Produce thematic maps of selected characteristics.
- Choose multiple options for downloading files, including a file transfer protocol (FTP) site for downloading large data files (such as the PUMS files).

Perhaps the most sophisticated feature of AFF2000 was the advanced query (AQ) function. This function enabled specified categories of users (see below) to create custom tabulations, subject to confidentiality filtering algorithms, from the underlying 100 percent detail file (HDF) and sample edited detail file (SEDF), as opposed to producing extracts from the summary files.⁴⁸ The AQ application was governed by a set of disclosure filters specified by the Disclosure Review Board (DRB).⁴⁹ Confidentiality algorithms were applied in the selection process to ensure that suitable detail in variable categorizations was selected in relationship to the population of the geographic universe specified. Posttabulation filters were applied to restrict the presentation of tabulations where sparse or low cell counts occurred. Access was provided with a user interface that was password-protected and available to internal Census Bureau staff as well as data users and analysts who obtained their passwords from the Customer Liaison Office. This latter group included Census Information Centers, SDCs, and some Federal Reserve banks. The external site of the AQ system was discontinued in December 2008.

Costs to Develop and Implement AFF

During the system's development, the Census Bureau hired a contractor to estimate the costs of completing development and implementing the system. While it was difficult to estimate early developmental costs with much accuracy, the agency produced reliable cost data for the development and implementation of AFF beginning with fiscal year 1998, when work began on the first production AFF system. The total cost data for FY 1998 through FY 2003 (the last year in which the Census Bureau received funding for release of Census 2000 data products) are contained in Table 9-1 and include all contractor and Census Bureau staff costs directly attributable to AFF. Given that AFF is a "corporate" system, that is, it disseminates data from a number of the agency's demographic and economic statistical programs, it is not practical to attempt to determine what proportion of these costs pertained exclusively to the dissemination of Census 2000 data.

⁴⁷ This function and the previous one are discussed in more detail in the "Principal Data Products" section of this chapter.

⁴⁸ These detail files are discussed at greater length in the section entitled "Prepublication Data Files."

⁴⁹ The DRB's principal responsibilities are to review proposed Title 13 survey and census data products (and special tabulations) for external distribution to identify and resolve disclosure risks; develop confidentiality protection policies and methodologies, and to communicate those techniques to the subject matter areas for application in producing data suitable for public dissemination. See U.S. Census Bureau, *Disclosure Review Board—Charter*, Office of Analysis and Executive Support, revised May 22, 2001.

Table 9-1.
**Total Development and Implementation
 Costs for American FactFinder: Fiscal
 Years 1998 to 2003**

Fiscal year	Total cost
1998.....	\$15.8 million
1999.....	\$10.8 million
2000.....	\$38.6 million
2001.....	\$22.2 million
2002.....	\$24.9 million
2003.....	\$9.0 million

Note: Cost figures are in nominal dollars.

Source: U.S. Census Bureau, Financial Management Reports, FY 1998 to 2003.

Evaluation of AFF

The Titan Systems Corporation conducted the only formal evaluation of AFF (as part of the Census 2000 Evaluation Program). The Titan Systems evaluation is the system requirements study cited in this section.⁵⁰ The evaluation focused on the development process for the system requirements, but also included general observations and findings about the development, implementation, and usability of AFF. Overall, the evaluation deemed AFF to be a “major success” by achieving a breakthrough in making a voluminous amount of data available to users through an electronic data access and dissemination system, and it called AFF a “. . . visionary undertaking which is revolutionizing data dissemination.”⁵¹

The evaluation noted that the Census Bureau adapted an iterative approach to development of AFF, in large part because the data from different program areas would become available for dissemination over a multiyear period, but also to allow for future expansion of the system. Thus, it was understood that there would be “requirements growth,” and the contracting approach incorporated this awareness. But adapting to constant revision and refinement of requirements was a time-consuming endeavor with significant cost implications.⁵² However, one of the advantages of the iterative development process was that partial system functionality was available to users while new functionalities were being developed for subsequent system iterations. Additionally, AFF could be continually improved and refined, because the iterative approach allowed for new functionality or technologies to be incorporated into the system.

In terms of usability, the report noted that while the system interface was generally acknowledged as good, site navigation and overall organization of the data were identified as needing improvement.⁵³ However, the evaluation was quick to point out that AFF served a variety of user types with differing degrees of computer and Census Bureau data knowledge and thus had to be “all things to all people.”⁵⁴ Because the system offered some advanced or sophisticated functions to expert users in a single interface environment, the interface had to be sophisticated enough to enable those users to carry out those functions efficiently. While earlier research (see the above discussion regarding “Ongoing Consultative Work”) and a contractor analysis suggested that the Census Bureau offer several different initial interfaces depending upon users’ knowledge of Census Bureau data and the tasks they would undertake with the data, the agency faced significant cost and timing constraints that precluded pursuing this approach.⁵⁵ The evaluation recommended that in making future refinements to the system, the Census Bureau consider providing different interfaces or “gateways” for different categories of users.⁵⁶

⁵⁰ “American FactFinder System Requirements Study.”

⁵¹ *Ibid.*, p. iv.

⁵² *Ibid.*, pp. iv–v.

⁵³ *Ibid.*, p. 8.

⁵⁴ *Ibid.*, p. v.

⁵⁵ *Ibid.*, p. 8. The referenced contractor report is “AFF/DADS Customer Segmentation and Critical Success Factor Analysis,” IBM e-business Solutions for Government Team, October 13, 1999.

⁵⁶ *Ibid.*, p. vi.

Innovations and Improvements for the Future

Employees of the Census Bureau's Decennial Automation Contracts Management Office, working with contractors, are responsible for continuing to make new data (including ACS data produced throughout the decade) available through AFF and for building new data access tools for users to interact more easily with AFF and obtain data more efficiently from it. Since the release of Census 2000 data on AFF, the Census Bureau has added new data sets and, based on extensive feedback from customers/users, new features. It plans to build on the success of AFF for the dissemination of Census 2000 data products by continuing to upgrade and improve the system for the 2010 Census.

PRINCIPAL DATA PRODUCTS⁵⁷

Census 2000 Data Product Review

Prior to finalizing decisions about the number, content, and format of Census 2000 data products, the Census Bureau sought advice from a wide variety of data users. These data users also provided advice on the most effective ways to disseminate the data. As part of this process, the agency contracted with the Association of Public Data Users (APDU) to form a working group of data users who would review and provide advice on the details of individual data products as well as on the total integrated product proposal. Due to the intensity of the project, the size of the working group was limited to about 20 expert data users who had worked with census data for at least two census periods, who had helped less experienced users gain access to census data, and for whom using census data was a significant part of their professional work. The working group included representatives of key segments of the data user community, such as state data centers (SDCs), universities, nonprofit organizations, for-profit companies, national data users, and librarians.⁵⁸

Beginning in 1999, the first contract involved a review process, with tasks jointly agreed upon by Census Bureau representatives and the cochairs and coordinator of the APDU working group. These "assignments" and relevant Census Bureau documents were distributed to the reviewers, together with deadlines for their responses. The reviewers sent their responses to the coordinator, who assembled them and prepared a summary of the responses to each assignment. The contractor also submitted an overall final report for the Census Bureau.

From February through September 1999, the Census Bureau asked the working group to assess the agency's plans for race and ethnicity tabulations, printed products, and the 100 percent summary file. Members of the working group expressed concern about the use of cell-suppression as a disclosure avoidance technique to protect confidentiality. For many, the preference was for data switching and/or collapsing problematic tabulation categories into a broader combined category. A number of working group members also opposed the use of population cutoffs for characteristics in small geographic areas, such as tracts and small minor civil divisions (MCDs), because this would impair their ability to aggregate tracts to customized geographic areas. For race and ethnic tabulations, group members were faced with trade-offs between data products containing race detail versus geographic detail.⁵⁹

In response to the second assignment, working group members urged the Census Bureau to expand the proposed list of printed products beyond the initial plan that called for local data provided by the Demographic Profile (one with 100 percent data and the other containing sample

⁵⁷ For a quick reference guide to the Census 2000 data products for the United States, see "Census 2000 Data Products at a Glance (United States)," available on the Census Bureau Web site at <<http://www.census.gov/population/www/censusdata/c2kproducts.html>>. Also available from that page are similar listings for Puerto Rico, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands. While data for Puerto Rico are presented alongside data for the United States in most data products, this section ("Principal Data Products") is not intended to provide a complete discussion of the data products pertaining to Puerto Rico and the Island Areas; that information can be found in Chapter 12, "Puerto Rico and the Island Areas."

⁵⁸ Patricia C. Becker, "Final Report, Fiscal Year 1999," Association of Public Data Users, Census 2000 Product Review, November 1999, p. 1.

⁵⁹ *Ibid.*, pp. 3–5.

data), a congressional district Demographic Profile (with the same tables as the Demographic Profile), and one printed report series containing 100 percent and sample data together with limited historical population and housing unit counts. Specifically, they recommended that the Census Bureau publish three separate reports comparable to the 1990 CPH-1⁶⁰ (100 percent data), CPH-5 (sample data), and CPH-2 (historical data) reports, especially given that data users who focused on local data emphasized the need for printed products to facilitate comparisons of census data over time.⁶¹

The APDU working group also evaluated the Census Bureau's plans for a single 100 percent summary file, which members suggested could be called Summary File 1 (SF 1). Working from the table outlines that the Census Bureau prepared from the 1998 Dress Rehearsal, reviewers indicated that the presentation of race and ethnicity in the file was complex and not user-friendly. The working group asked the agency to consider adopting a data file structure similar to that used in 1980 and 1990, with four summary files—two files (SF 1 and SF 2) containing 100 percent data and two files (SF 3 and SF 4) containing sample data. Within this structure, SF 1 would contain racial and ethnic counts and a limited number of characteristics by race down to the block level. SF 2 would contain single years of age by sex, tables presented at the census tract level, and race and ethnic iterations of 100 percent data. SF 3 would contain sample data, at either the block group or tract level, while SF 4 would be similar to summary tape file 4 for 1990, but simpler.⁶²

The Census Bureau extended its contract with the APDU working group for FYs 2000 and 2001. During FY 2000, the Census Bureau agreed that the working group again concentrate on the general summary file structure and on finalizing SF 1, as well as review the printed report *Summary Population and Housing Characteristics* (PHC-1); the housing tables in SF 3 and SF 4; and the software to be bundled with CD-ROM data products. For the last contract (FY 2001), working group members evaluated and made recommendations on two printed reports—*Summary Social, Economic, and Housing Characteristics* (PHC-2) and *Population and Housing Unit Counts* (PHC-3).⁶³

Recommendations during the second review period showed that most working group respondents preferred numbering the summary files as SF 1 through SF 4. They noted that it was unnecessary to include redistricting (P.L. 94-171) data on SF 1; supported the inclusion of tables at the census tract level on SF 1; and wanted the agency to provide a shorter record for blocks on SF 1.⁶⁴ Turning to the PHC-1 printed report, reviewers recommended breaking up the 25- to 44-year-old age bracket into two 10-year brackets; substituting “related children” for “own children” within households; adding an “other relatives under 18” column; and including “owner,” “renter,” and “total” vacancy rates (and eliminating the “population per occupied unit” column).⁶⁵

In assessing user needs for housing unit data on SF 3 and SF 4, the APDU coordinator first noted that the number of sample housing tabulations in 2000 was larger than it had been in 1990 because of the number of questions that moved from the short form to the long form in 2000 and that there was an increase in the number of race iterated tables. Some working group members tended to favor using 10-year age groups where possible, while others wanted more detailed age groupings. The group also felt that the size of SF3 was overwhelming and wondered whether some of the larger tables could be collapsed. On some issues, such as the file sequence of geographic areas and race categories, the members were unable to arrive at a consensus.⁶⁶

The purpose of the bundled software, then referred to as “Allocate,” was to provide data users with a convenient way to tabulate the summary file records. Group members concluded that the software did provide an important service to users by helping them access summary files in ways

⁶⁰ As indicated below, the “CPH” report series was renamed the “PHC” series for the Census 2000 data products. This revision was made at the suggestion of the APDU reviewers.

⁶¹ “Final Report, Fiscal Year 1999,” November 1999, pp. 10–11.

⁶² *Ibid.*, pp. 18–19.

⁶³ During FY 2001, the working group also assessed the 1998 American Community Survey CD-ROM and the tools, metadata, and means of access on the Census Bureau's Web site for working with the Census 2000 Supplementary Survey results.

⁶⁴ Patricia C. Becker, “Final Report, Fiscal Year 2000,” Association of Public Data Users, Census 2000 Product Review, October 2000, p. 7.

⁶⁵ *Ibid.*, pp. 19–22.

⁶⁶ *Ibid.*, pp. 26, 30–32.

that would not otherwise have been possible. However, they noted that the software contained “bugs” and that substantial time and resources would be required to fix these problems. Largely agreeing that no software should be expected to meet all the needs of all users, working group members suggested that the Census Bureau had correctly targeted the large middle group of customers between novice users and those who would need specially-written software for their applications.⁶⁷

During the last contract with APDU, most reviewers said they did not need the number and detail of the block group tables the Census Bureau proposed for SF 3 and that most of the remaining block group tables could be presented by total population rather than for each of the individual race groups. A related suggestion was that all the block group tables should be moved to a separate file, leaving the SF 3 file with all the remaining tables from the tract level to the higher geographic levels.

Finally, reviewers were generally pleased with the Census Bureau’s basic design for the *Summary Social, Economic, and Housing Characteristics* (PHC-2) printed report. There were many comments and suggestions on the components of individual tables, but the reviewers did not identify any glaring problems with the Census Bureau’s plans for the PHC-2 series of reports. The reviewers expressed similar support for the proposed layout and table outlines for the *Population and Housing Unit Totals* (PHC-3) report series.⁶⁸

The Census Bureau considered carefully the comments and suggestions from the APDU working group and other groups of stakeholders (such as the agency’s advisory committees and officials from other government agencies). Census Bureau officials adopted a number of the recommendations, such as changing the naming conventions for and adding to the number of summary files (SF 1, SF 2, SF 3, and SF 4); including two additional printed report series (PHC-2 and PHC-3); and revising table layouts, thresholds, and summary levels.

Census 2000 Gateway Web Page

An earlier section discussed the development and implementation of American FactFinder (AFF). However, not all Census 2000 data products were available through AFF. The “Census 2000 Gateway” page⁶⁹ on the agency Web site provides access not only to AFF, but also provides a framework for understanding the range of data products and other tabulations available through the Internet. Electronic files of Census 2000 data and geographic products and selected special tabulations are accessible from that page, as are portable document format (PDF)⁷⁰ versions of many printed reports, including the PHC series, the Census 2000 Briefs and Special Reports, and data product technical documentation. Internet users can print these PDF documents and thereby produce near publication-quality copies of the printed reports and other materials.

The Census 2000 Gateway Web page also provides access to information about online product ordering; local sources of Census 2000 data (for example, Census Bureau regional offices, state data centers, Census Information Centers, and federal depository libraries); subject-matter contacts; Census 2000 programs and operations, including the evaluation program and Executive Steering Committee for A.C.E. Policy (ESCAP) analyses (these subjects are covered in Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs”); and many more Census 2000-related topics. There are also informational links targeted to particular groups or entities: for example, access to news releases, tip sheets, and Web casts, for members of the news media; Census in Schools lesson plans, teaching kits, and resource materials, for school teachers and administrators; and information about partnerships for elected officials and others. The “Gateway” Web page also provides access to data relating to other decennial censuses, including 1990 census publications and selected historical census data from 1790 to 1990.

⁶⁷ Ibid., pp. 41–43.

⁶⁸ Patricia C. Becker, “Final Report, Fiscal Year 2001,” Association of Public Data Users, Census 2000 Product Review, November 2001, pp. 55–58, 65–66.

⁶⁹ The URL for the Census 2000 Gateway Web page is <<http://www.census.gov/main/www/cen2000.html>>.

⁷⁰ PDF files require Adobe Acrobat Reader software, which is available free of charge from the Adobe Corporation.

Redistricting Data Program

Background. A finding by the National Legislative Conference (NLC) indicated that data products from the 1970 census hindered individual states' efforts to comply with the "one-person, one-vote" provisions of the 1965 Voting Rights Act.⁷¹ The Census Bureau and the NLC responded by creating a partnership in 1972 to improve the quality of census data products in this regard. In 1974, the partnership suggested that state governments "define small census tabulation areas to coincide with the boundaries of local election precincts" in the 1980 census.⁷² In congressional hearings, state legislatures emphasized the need for a 100 percent count of the population for census blocks and voting districts (VTDs).

In 1975, President Gerald Ford signed Public Law (P.L.) 94-171 directing the Census Bureau to provide states with 100 percent population counts by state-specified geographic areas within 1 year of Census Day. This requirement amended Title 13, U.S. Code, and added to Census Bureau requirements mandated in Sections 2 and 5 of the Voting Rights Act that the Census Bureau provide race and voting-age counts to support the legal requirement to achieve a racial and ethnic balance.⁷³

The need to delineate census blocks across the nation became apparent when only 23 states participated in the Census Bureau's Redistricting Data Program in the 1980 census. As a result, the Census Bureau substantially improved its geographic program and mapping technology. By 1990, the Topologically Integrated Geographic Encoding and Referencing (TIGER)[®] system provided the agency the ability to produce paper maps and digital products consistent with data tabulations at all geographic levels, including census blocks.⁷⁴

The Census Bureau conducted a three-phase Redistricting Data Program as part of the 1990 census:

- The Block Boundary Suggestion Project. Through this project that took place in 1985, 38 states suggested visible features to be used as 1990 census block boundaries and ultimately as VTD boundaries.
- The Voting District Project. The Census Bureau, in 1989, worked with 46 states to delineate VTD boundaries on census maps generated by the TIGER system.
- P.L. 94-171 data delivery to state officials. This phase took place in 1991.

With its evaluation of the 1990 Redistricting Data Program, the Reapportionment Task Force of the National Conference of State Legislatures (NCSL), as the NLC was renamed in 1975, endorsed the Census Bureau's efforts and encouraged the agency to maintain close working relationships with state legislatures and minority organizations to meet the needs of the states.

Legal issues relating to the redistricting data. Under the revised Census 2000 Operational Plan released on February 23, 1999, the Census Bureau stated its intention to produce statistically adjusted data—based on the results of the Accuracy and Coverage Evaluation (A.C.E.) program—for nonapportionment uses of the Census 2000 data, including redistricting.⁷⁵

The Census Bureau later formally presented its preliminary determination that (1) it was feasible to produce, within the statutory deadline for releasing redistricting data to the states, statistically adjusted block-level data that could be used for redistricting and (2) the agency expected that the

⁷¹ The principle of "one-person, one-vote" was initially established by the 1964 Supreme Court case of *Wesberry v. Sanders* (376 U.S. 1 (1964)) and subsequent Supreme Court decisions.

⁷² See National Legislative Conference Reapportionment Committee, *Improving the 1980 Census* (Report to the U.S. Congress), Lexington, KY: Council of State Governments, 1974.

⁷³ Amendment of Title 13, U.S. Code by P.L. 94-171 is reflected in Section 141(c) of Title 13.

⁷⁴ The TIGER system was developed by the Census Bureau's Geography Division in cooperation with the U.S. Geological Survey. See U.S. Census Bureau, *1990 Census of Population and Housing, History, Part C*, 1990 CPH-R-2C (Washington, DC: U.S. Government Printing Office, 1995), pp. 3-18-3-24.

⁷⁵ Department of Commerce, "Updated Summary: Census 2000 Operational Plan," February 23, 1999, pp. 1 and 13. For information about the Census Bureau's original plan for Census 2000, see footnote 5 earlier in this chapter.

adjusted data would be the most accurate data available.⁷⁶ However, the Census Bureau noted that it would not “. . . release corrected [statistically adjusted] redistricting data until it had brought its technical judgment to bear in assessing the available data to verify that its expectations . . . [had] been met.” The agency went on to state: “If the Census Bureau determines that incorporating the results of the survey would not improve the accuracy of the initial census counts, then the uncorrected [unadjusted] data would be denominated as the P.L. 94-171 [redistricting data] file.”⁷⁷

On March 1, 2001, based on the report of the Executive Steering Committee for A.C.E. Policy (ESCAP),⁷⁸ the Director of the Census Bureau concurred with and adopted the committee’s recommendation that the unadjusted data be designated as the official redistricting data.⁷⁹ Census 2000 adjusted block-level data had been prepared in the event the Secretary of Commerce decided in favor of adjustment. These data were available for release to states and localities within the deadline stipulated in P.L. 94-171 (within 1 year following the decennial census date). On March 6, 2001, Secretary of Commerce Donald L. Evans announced his determination, based on the ESCAP report and the Census Bureau Director’s recommendation, that the unadjusted data would be the official redistricting data.⁸⁰ Thus, the unadjusted data were the only data released to the public. The Secretary stated that the release of the adjusted data would be considered at a later time following the ESCAP’s further investigation.⁸¹ As a result of this decision, the Census 2000 adjusted block-level data were the subject of Freedom of Information Act requests and litigation.⁸²

Development and implementation of the Redistricting Data Program. In 1995, the Director of the Census Bureau officially launched the Redistricting Data Program for Census 2000 by inviting state officials to participate.⁸³ Initially, the program addressed three policy issues: adjustment, military enumeration, and the collection and presentation of data on race and Hispanic origin.

Following the Census Bureau’s May 1995 release of its plan for Census 2000, the NCSL Redistricting Task Force passed a resolution in July requiring a “one-number census” that incorporated statistical adjustment in the counts transmitted to the states.⁸⁴ A second resolution called for military commanders to work with the Census Bureau to provide enumerators access to bases in order to provide states with enumeration totals on a block-by-block basis inside military bases. The NCSL adopted both resolutions as policy positions.⁸⁵

For the 1980 and 1990 censuses, the Census Bureau supplied the states with race and Hispanic-origin data in addition to population counts to help states comply with the one-person, one-vote decisions and Voting Rights Act requirements. After consulting with the NCSL Redistricting Task Force in 1995, the U.S. Office of Management and Budget (OMB) created an interagency committee to explore possible modification of OMB Statistical Policy Directive No. 15 on federal race and ethnic statistics that would allow respondents to indicate multiple racial backgrounds. On October 30, 1997, the OMB announced its adoption of the committee’s recommendations concerning reporting more than one race:

- When self-identification is used, a method for reporting more than one race should be adopted.
- The method for respondents to report more than one race should take the form of multiple responses to a single question and *not* a “multiracial” category.

⁷⁶ *Federal Register*, Vol. 65, No. 119, June 20, 2000, p. 38374.

⁷⁷ *Ibid.*, p. 38393.

⁷⁸ ESCAP was a committee of senior Census Bureau officials charged with making a recommendation to the Director regarding whether the official redistricting data should incorporate a statistical adjustment.

⁷⁹ *Federal Register*, Vol. 66, No. 46, March 8, 2001, p. 14004.

⁸⁰ The Secretary announced his decision at a March 6, 2001, news conference and documented it in a March 7 memorandum. See *Federal Register*, Vol. 66, No. 49, March 13, 2001, pp. 14520–21.

⁸¹ Transcript of press conference on Census 2000 redistricting data, held at the U.S. Department of Commerce, March 6, 2001, Federal News Service, Washington, DC, p. 2.

⁸² These events are discussed in detail in the relevant sections of Chapter 11, “Legal Issues.”

⁸³ U.S. Census Bureau, *Designing P.L. 94-171 Redistricting Data for the Year 2010 Census: The View from the States*, September 2004, p. 8.

⁸⁴ For more information on the Census Bureau’s original plan for Census 2000, see “The Debate Over the Use of Sampling” section of Chapter 11, “Legal Issues.”

⁸⁵ *Designing P.L. 94-171 Redistricting Data for the Year 2010 Census: The View from the States*, p. 9.

- When a list of races is provided to respondents, the list should not contain a “multiracial” category.
- Two acceptable forms for the instruction accompanying the multiple response question are “mark one or more” and “select one or more.”
- If the criteria for data quality and confidentiality are met, provision should be made to report, at a minimum, the number of individuals identifying with more than one race. Data producers are encouraged to provide greater detail about the distribution of multiple responses.
- The new standards will be used in the decennial census and other data producers should conform as soon as possible, but not later than January 1, 2003.⁸⁶

In November 1997 and again in April 1998, the Census Bureau and the NCSL Redistricting Task Force reviewed the proposed P.L. 94-171 file for the Census 2000 Dress Rehearsal. This file (P.L. 63 Matrix) would include 63 race categories (representing all of the possible single and multiple responses to the race question)—cross-classified by voting age and Hispanic or Latino or not—for each census block, state-specified voting district, census tract, place, county, etc., yielding approximately 260 data items for each geographic area.

State officials initially expressed concerns over the prospect of processing alternative redistricting plans based on the P.L. 63 Matrix, and Census Bureau experts as well as affiliated advisors voiced concerns about confidentiality with such detailed information for small geographic areas. To quell these concerns, the Census Bureau consulted the Voting Rights Section of the Civil Rights Division, U.S. Department of Justice (DOJ), in June 1998 to determine the level of detail required for compliance with the Voting Rights Act. Based on these investigations, the Census Bureau developed an alternative matrix limited to 20 racial categories, called the P.L. 20 Matrix. Although the Census Bureau and the NCSL Redistricting Task Force determined that the P.L. 20 Matrix would meet the needs of the redistricting community in theory, in practice, data users discovered that the product did not provide enough flexibility for the range of programs that used the data.

To resolve this problem, the Census Bureau, at the request of the DOJ, retabulated the dress rehearsal data using the P.L. 63 Matrix and revised the disclosure avoidance procedures to protect individual data responses. These data were distributed to the states and NCSL to familiarize users with the larger files. Ultimately, the Census Bureau tabulated Census 2000 P.L. 94-171 data using this approach. On January 17, 2001, the DOJ provided users with detailed guidance on how to use the new race data in compliance with the provisions of the Voting Rights Act.⁸⁷

For Census 2000, the Census Bureau’s Redistricting Data Program followed the three-phase model introduced with the 1990 census. Phase 1, the Block Boundary Suggestion Project (BBSP), began in 1995 but encountered delays as a result of the late 1995/early 1996 government shutdowns. Completed in January 1998, the BBSP offered state redistricting officials the opportunity to identify map features to be held as Census 2000 block boundaries and to specify those that they desired not be so designated.⁸⁸ Once agreed upon, the Census Bureau identified these boundaries in the TIGER database to be held as tabulation block boundaries. Evaluations of the Census 2000 BBSP indicated the following for planning the 2010 Census:

- The states favored combining the BBSP with the Voting District Project, which occurred later in the decade.
- Features designated by the state, including those flagged as guaranteed block boundaries or must-hold block boundaries, should not be deleted by the Census Bureau without first conferring with the state liaison. The Census Bureau and the states should work together to determine an efficient way to group islands into more usable tabulation blocks.

⁸⁶ *Federal Register*, Vol. 62, No. 210, October 30, 1997, pp. 58782–90.

⁸⁷ *Designing P.L. 94-171 Redistricting Data for the Year 2010 Census: The View from the States*, pp. 9–11.

⁸⁸ Visible map features used to delimit a census block boundary include streets, roads, streams, shorelines, and the like. Invisible map features used for this purpose include county lines, city limits, property lines, and the like. For more information, see Chapter 7, “Census Geography and the Geographic Support System.”

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- The Census Bureau should retain previously submitted block boundary suggestions in its database from census to census.⁸⁹

Phase 2, the Voting District Project, followed the BBSP. Completed in October 2000, this project encouraged state redistricting officials to submit the boundaries and geographic codes of voting districts and state legislative districts using visible features or legal area boundaries. These areas were then inserted into the TIGER database.⁹⁰ Forty-six states, the District of Columbia, and Puerto Rico participated in Phase 1 and Phase 2 of the Redistricting Data Program. Of those participants, thirty-six states provided both voting district and state legislative district boundaries and codes, while eight provided this information only for voting districts, and four provided it only for state legislative districts.

Phase 3 of the Census 2000 Redistricting Data Program, the delivery of P.L. 94-171 data and accompanying geographic products, took place between January and March 2001. By early January 2001, officially designated recipients in each state received the TIGER/Line® files (see the “Geographic Products” section for a description of these files), which included voting districts and state legislative districts. Beginning on March 7, 2001, and concluding on March 30, 2001, the Census Bureau delivered CD-ROMs containing the official P.L. 94-171 data to the Governor and majority and minority legislative leaders in each state. Once delivery was confirmed by the states, the District of Columbia, and Puerto Rico, the Census 2000 Redistricting Data (P.L. 94-171) Summary Files were released on American FactFinder.

Demographic Profiles

The demographic profiles provided demographic, social, economic, and housing characteristics in four separate tables. These profiles presented data for individual states, state-equivalents, the nation, and numerous other geographic entities, including congressional districts (106th Congress). Between May 15 and June 7, 2001, the Census Bureau released the 100 percent data demographic profiles, and between May 7 and June 4, 2002, it released the demographic profiles based on sample data. All demographic profiles were available on the Internet, CD/DVD-ROM, and in print.

Housing Unit Counts

Following the release of the redistricting data, many state and local government officials sought housing unit counts below the county level. Officials wanted these data prior to the first state releases of Summary File 1 (SF 1) in June 2001. Consequently, to meet this demand, the Census Bureau produced a special product that contained housing unit counts for states, the District of Columbia, and Puerto Rico down to the place level. This product was released via the Internet on May 31, 2001.

Race and Hispanic or Latino Summary File

To meet the demand for a national summary of the data released in the state-level Redistricting Data (P.L. 94-171) Summary Files, the Census Bureau released the Race and Hispanic or Latino Summary File on June 27, 2001, through the Internet FTP site and on CD-ROM. This product provided the same tables found in the Redistricting Data Summary Files for the United States, regions, divisions, and American Indian areas that cross state boundaries, as well as for states and counties.

Summary Files 1 and 2⁹¹

In addition to the redistricting data, the Census Bureau provided two summary files based on the 100 percent data items from Census 2000. Summary File 1 (SF 1) contained 286 detailed tables focusing on age, sex, households, families, and housing units. Selected tables were repeated for

⁸⁹ *Designing P.L. 94-171 Redistricting Data for the Year 2010 Census: The View from the States*, p. 14.

⁹⁰ U.S. Census Bureau, “Census 2000 Operational Plan,” DMD/01-1419, December 2000, p. XIII-4.

⁹¹ As explained in the “Redistricting Data Program” section of this chapter, the redistricting data were subject to a possible statistical adjustment. If the official redistricting data had incorporated a statistical adjustment, all the other official 100 percent data products would likely have been produced from a statistically adjusted detail file as well. See the “Prepublication Data Files” section of this chapter for additional information on this issue.

nine major race and Hispanic or Latino groups: White alone; Black or African American alone; American Indian and Alaska Native alone; Asian alone; Native Hawaiian and Other Pacific Islander alone; Some Other Race alone; Two or More Races; Hispanic or Latino; and White alone, not Hispanic or Latino. These tabulations also provided population counts for 63 race categories and Hispanic or Latino populations. Additionally, SF 1 provided counts for 40 specified American Indian and Alaska Native tribal groupings⁹² and 4 generic tribe categories; race categories including 18 Asian groups and 12 Native Hawaiian and Other Pacific Islander groups; and 28 categories of Hispanic origin.

For the states, the District of Columbia, and Puerto Rico, SF 1 presented data in a hierarchical sequence down to the block level for most tabulations, but only to the census tract level for others. Data for other geographic areas, such as ZIP Code tabulation areas (ZCTAs) and congressional districts, were also included. The Census Bureau released SF 1 through American FactFinder (AFF) and on CD/DVD-ROM between June 13 and August 22, 2001, for the states. On November 16, 2001, an advance national file became available and on October 23, 2002, the agency released the final national file containing population and housing unit counts categorized by “urban” or “rural” data. Lastly, on June 11, 2003, the Census Bureau released the SF 1 “supplement” file, which contains these same data down to the block level.

Summary File 2 (SF 2) contained 47 detailed tables focusing on age, sex, households, families, and occupied housing units for the total population and for 249 American Indian and Alaska Native tribal groupings, race groups, and Hispanic or Latino groups having a population of 100 or more within the specified geographic area. SF 2 data are presented for census tracts and higher levels of geography.

The Census Bureau released SF 2 through AFF and on CD/DVD-ROM for the states between December 27, 2001, and April 24, 2002. On May 29, 2002, the agency released an advance national file for SF 2, and the final national file for SF 2 became available on January 25, 2003. As with SF 1, the only difference between the advance and final national SF 2 files was the inclusion of urban and rural data on the final file. On March 27, 2003, in response to comments from data users, the Census Bureau published, on the Internet only, a supplement for SF 2 that included a table showing sex by age for the population in households and tabulated by the race, Hispanic origin, or tribe of each individual. The original SF 2 provided a table showing sex by age for the population in households by the race, Hispanic origin, or tribe of the householder.⁹³

Summary Files 3 and 4⁹⁴

Summary Files 3 and 4 provided data users with information on social, housing, and economic characteristics from a sample of approximately 19 million housing units (about 1 in 6 households) that received the Census 2000 long-form questionnaire. Summary File 3 (SF 3) included data on ancestry groups, income, poverty status, citizenship, educational attainment and school enrollment, and other long-form information.

SF 3 consisted of 813 detailed tables compiled from the sample data.⁹⁵ Fifty-one tables were repeated for the nine major race and Hispanic or Latino groups (see above).

SF 3 presented data for the United States, each state, the District of Columbia, and Puerto Rico in a hierarchical sequence down to the block group for many tabulations. Others only were available down to the census tract level. Data were included for other geographic areas such as ZCTAs and congressional districts. Between August 6 and September 25, 2002, the Census Bureau released SF 3 through AFF and on CD/DVD-ROM.

⁹² Tribal grouping refers to the combining of individual American Indian tribes into a general tribal grouping; for instance combining Fort Sill Apache, Jicarilla Apache, and Mescalero Apache, into the general Apache tribe, or combining individual Alaska Native tribes, such as American Eskimo and Greenland Eskimo, into the general Eskimo tribe.

⁹³ The householder is defined as the member of a household who lives at a housing unit and owns, is buying, or rents the housing unit.

⁹⁴ As discussed in the “Prepublication Data Files” section of this chapter, the Census Bureau considered (but ultimately rejected) producing the sample (or long-form) data products by weighting the sample data to population totals in the 100 percent detail file that incorporated a statistical adjustment. For additional information about this decision, see “The Debate Over the Use of Sampling” section of Chapter 11, “Legal Issues.”

⁹⁵ SF 3 included 484 population tables and 329 housing tables that were identified according to geographic coverage.

SF 4 presented sample data in 213 population tables and 110 housing tables. Each table was iterated for 336 population groups: the total population, 132 race groups, 78 American Indian and Alaska Native tribe categories (reflecting 39 individual tribal groupings), 39 Hispanic or Latino groups, and 86 ancestry groups.⁹⁶

The Census Bureau released SF 4 as individual files for each of the 50 states, the District of Columbia, and Puerto Rico between April 29 and July 30, 2003. The national file also was available by July 30, 2003. The lowest level of geographic coverage for data presented in SF 4 was the census tract.

Tables

For Census 2000, the Census Bureau published quick tables and geographic comparison tables sourced from the summary files. Quick tables, available through AFF and on CD/DVD-ROM, provided data users with a predefined table containing population and housing characteristics for which users could specify a geographic area and a population group. Generally, these tables presented data at the census tract level, although some quick tables were available down to the block group or block level. For 100 percent data, quick tables were published between March 7, 2001, and April 24, 2002; for sample data, quick tables were published between August 6, 2002, and July 30, 2003. The demographic profiles discussed above are a type of quick table.

Geographic comparison tables enabled users to compare population and housing characteristics for selected geographic areas (for example, all places within a state). Available through AFF, these tables also presented data at the census tract level. The Census Bureau released geographic comparison tables for 100 percent data for the states between March 7, 2001, and April 24, 2002, and for the nation between November 16, 2001, and January 25, 2003. Geographic comparison tables based on sample data were released between August 6, 2002, and July 30, 2003.

American Indian and Alaska Native Summary File

The American Indian and Alaska Native Summary File (AIANSF) contained sample data presented in 213 population tables and 110 housing tables. The tables were iterated for the total population, the total American Indian and Alaska Native population, the total American Indian population, the total Alaska Native population, and for 1,081 additional specified American Indian and Alaska Native tribes. For any of these iterations, tables were shown only if the specific population threshold was met.⁹⁷

The AIANSF was released as one file and provided data for the United States, regions, divisions, states (Puerto Rico and the Island Areas were not included as state equivalents),⁹⁸ metropolitan areas, and American Indian and Alaska Native areas.

Congressional District and State Legislative District Summary Files

Congressional District Data Summary Files. Beginning with the 108th Congress, which was the first Congress redistricted based on Census 2000 P.L. 94-171 data,⁹⁹ the Census Bureau released Congressional District Data Summary Files (CDDSF) for each newly convened Congress for which one or more states redrew their congressional district boundaries. The files contained Census 2000 100 percent and sample data for congressional districts. The 100 percent data files contained the same basic characteristics as provided in SF 1, while the sample data files included

⁹⁶ Tables for any population group excluded from SF 2 because the group's total population in a specific geographic area did not meet the SF 2 threshold of 100 people were also excluded from SF 4. In addition, SF 4 tables were also excluded if there were less than 50 unweighted sample cases of a population group in a specific geographic area. For the ancestry iterations, only the 50 unweighted sample cases test was performed.

⁹⁷ The population threshold and number of unweighted sample cases as required for SF 4 also pertained to the AIANSF. The threshold was based on respondents who reported only one tribe.

⁹⁸ For data presentation purposes, the Census Bureau treats the District of Columbia, Puerto Rico, and each of the Island Areas (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands) as "state equivalents" in many Census 2000 data products.

⁹⁹ The Census 2000 Redistricting Data Program is discussed earlier in this section.

the detailed characteristics found in SF 3. The data were presented for all states, the District of Columbia, and Puerto Rico. On March 17, 2003, the Congressional District (CD) Data Summary Files for the 108th Congress were released on AFF, through the Internet as downloadable FTP files, and on CD/DVD-ROM.

For the 109th Congress, three states—Maine, Pennsylvania, and Texas—redrew their congressional district boundaries, and thus the 109th CD Summary Files presented data for these districts that differed from what was presented in the 108th CD products; all other states remained the same as displayed in the earlier products. Similarly, Georgia and Texas districts were redrawn for the 110th Congress, and the 110th CD products reflected these new districts, while all other states remained the same as presented in the 109th CD Summary Files.

State Legislative District Summary Files. These files, new for Census 2000, provided data summaries for upper and lower chamber state legislative districts (SLDs). The 100 percent and sample population and housing characteristics were presented for all states, the District of Columbia, and Puerto Rico. For Nebraska, which has a unicameral legislature, and the District of Columbia, which has a city council, the data were presented for the sole legislative chamber.

The boundaries for these legislative districts were provided by the states as part of Phase 1 of the 2010 Census Redistricting Data Program and reflect redistricting that occurred following Census 2000. Thus, they are different from those shown in the Census 2000 Redistricting Data (P.L. 94-171) Summary File.

The 100 percent State Legislative District Summary Files contained the same basic subject characteristics as SF 1, and the sample files included the same detailed subject characteristics as SF 3. These files were released on January 4, 2007, on AFF, through the Internet as downloadable FTP files, and on CD/DVD-ROM.

Printed Reports (PHC Series)

Census 2000 data for the United States, individual states, the District of Columbia, and Puerto Rico were published in three printed report series: PHC-1, *Summary Population and Housing Characteristics*; PHC-2, *Summary Social, Economic, and Housing Characteristics*; and PHC-3, *Population and Housing Unit Counts*. In each series, there is one report for each state, the District of Columbia, and Puerto Rico (in English and Spanish), as well as a summary report for the U.S. Many tables in the U.S. summary reports contain data for Puerto Rico.

Summary Population and Housing Characteristics (PHC-1). This series contained information collected on a 100 percent basis and extracted from SF 1. Data are presented for states, counties, places, and other areas. The agency published this report series on the Internet (available as PDF files) and in print between May 30 and December 2, 2002. This series is similar to the 1990 census CPH-1 series.

Summary Social, Economic, and Housing Characteristics (PHC-2). This publication included information on the sample population and housing subjects for states, counties, places, and other areas. The data were extracted from SF 3. The agency published this report series on the Internet and in print between March 13 and July 24, 2003. This series is similar to the 1990 census CPH-5 series.

Population and Housing Unit Counts (PHC-3). This report series included population and housing unit counts for Census 2000 as well as for the 1990 and 1980 censuses. Information on land- and water-area measurements and population density also was included. The agency published this report series on the Internet and in print between June 11, 2003, and April 8, 2004. This series is similar to the 1990 census CPH-2 series.

Social, Economic, and Housing Characteristics—Island Areas (PHC-4). Census 2000 data for the Island Areas were published in this series. The questionnaires used in the Island Areas enumeration were similar to the stateside long-form questionnaire in terms of the number and types of questions asked. For example, the forms used in American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam contained 27 questions relating to housing characteristics

and 37 relating to population characteristics. In the U.S. Virgin Islands, questionnaires included 24 housing questions and 36 population questions. The data are presented in one report for each of the Island Areas: Guam (released May 27, 2003), American Samoa (released June 13, 2003), the Commonwealth of the Northern Mariana Islands (released June 19, 2003), and the U.S. Virgin Islands (released June 4, 2003).

Characteristics of American Indians and Alaska Natives by Tribe and Language: 2000 (PHC-5). The source file for this two-volume report was the AIANSF described above. The report included 80 tables of population and/or housing characteristics shown for the United States, regions, divisions, states, and metropolitan areas. It included sample data for those American Indian or Alaska Native tribes that met the population threshold and number of unweighted sample case requirements for the AIANSF. The report also contained data on language not found in any other census product. This printed report was released in December 2003.

Other Reports

Census 2000 Briefs. The Census 2000 Briefs provided the first analysis of Census 2000 data and thus served as a basic analytic tool useful for introducing the public to Census 2000 population and housing topics. The briefs focused on discussing the most important aspects of the topics, as well as exploring the geographic distribution of the subject matter. They covered the full gamut of Census 2000 topics from the short- and long-form questionnaires and were made available in print and on the Census Bureau's Web site as PDF documents.¹⁰⁰ There are a total of 36 Census 2000 Briefs, and they were released on a flow basis with the first one, *Overview of Race and Hispanic Origin*, issued in March 2001. The briefs based on sample data were issued beginning in 2003; the last one in the entire series, *Household Income: 1999*, was issued in June 2005.

Census 2000 Special Reports. The Census 2000 Special Report series provided in-depth analyses of Census 2000 population and housing topics.¹⁰¹ The reports utilized different modes of analysis, such as discussion text, maps, text tables, and graphics, to examine a wide range of topics, including race, household composition, migration and geographic mobility, population in emergency and transitional shelters, poverty, earnings, residential finance, and disability. Some of the reports in the series rely on data from multiple censuses—for comparison purposes and to provide historical perspective. The 29 Census 2000 Special Reports were released on a flow basis—with the first report issued in 2001 and the last one in 2007—and were made available on the Census Bureau's Web site as PDF documents and in print. *Mapping Census 2000: The Geography of U.S. Diversity* and *Census Atlas of the United States*, although part of the Census 2000 Special Report series, are described in the "Geographic Products" section of this chapter because of their principal reliance on maps to convey the data presented in those publications.

Other Tables

Census 2000 PHC-Ts. The Census Bureau also produced population and housing data tables that were not part of the summary files in AFF or in the printed reports series. Frequently, these tables were associated with Census 2000 Briefs or Special Reports, but others were independent products. As of December 2008, there were 43 products identified as PHC-Ts, covering subjects such as multigenerational households, detailed American Indian and Alaska Native tribes, migration, language use and ability, working at home, the daytime population, percent urban for PUMAs (Public Use Microdata Areas) and super-PUMAs, and detailed ancestry groups. These tables are listed on the Census 2000 Gateway Web page (discussed earlier).

Microdata

Microdata allow users to prepare their own customized tabulations and cross-tabulations of most population and housing subjects. These specially prepared microdata files contain the actual responses to census questionnaires (subject to disclosure avoidance techniques), with the names

¹⁰⁰ A list of all the Census 2000 Briefs and Special Reports as well as the documents themselves can be found at <<http://www.census.gov/population/www/cen2000/briefs/index.html>>.

¹⁰¹ U.S. Census Bureau, *Residence Finance Survey: 2001*, Census 2000 Special Reports, CENSR-27, contains statistical summaries of data from the survey, which was conducted in 2001 as part of Census 2000.

and addresses removed and the geography sufficiently broad to protect confidentiality. The Census Bureau released two sets of public use microdata sample (PUMS) files—1 percent and 5 percent sample files—through the Internet as downloadable FTP files and on CD/DVD-ROM with software to assist data users in creating tabulations. The 1 percent sample files provided information for geographic areas called super PUMAs, having a minimum population of 400,000 inhabitants. These files became available between April 23 and June 4, 2003. The 5 percent sample PUMS files provided information for PUMAs, which had a minimum population of 100,000; these files were released between August 6 and September 24, 2003. The Census Bureau also released geographic equivalency files to show the relationship between PUMAs and other types of geography, such as counties and places.

GEOGRAPHIC PRODUCTS

Background: Product Planning and Technological Developments

The formal planning process relating to Census 2000 geographic products began in 1996 as part of the preparations for the 1998 Dress Rehearsal. The planning process included, among other activities, reviewing the 1990 census product line, weighing the expectations of census customers, and engaging in a major outreach program aimed at evaluating customers' needs based on responses to Census Bureau product proposals. Key activities included:

- Outreach and information programs coordinated by the Census Bureau's Redistricting Data Office to ascertain the redistricting community's needs for geographic products. These activities included attending meetings of state government officials and giving presentations at conferences about the plans for geographic products for redistricting.
- Giving presentations at meetings of numerous professional organizations, such as the Urban and Regional Information Systems Association and the Association of American Geographers, as well as at state and regional geographic information system (GIS) conferences.
- Making available via the Census Bureau Web site information describing planned geographic products.

As discussed in more detail in the American FactFinder (AFF) section of this chapter, by the mid-1990s, the Census Bureau was among a few federal agencies to use the Internet for information and product dissemination. The public's positive reaction to this development spurred planning for a much broader distribution of the Census 2000 products through this medium. In fact, Census Bureau staff concluded that almost all its census-related products, including geographic products, could be made available on the Internet.

Maps—the most widely used geographic product—could have presented a significant challenge to Internet distribution were it not for another advance in computer-related technology. The Adobe Corporation developed and made available the portable document format (PDF) with free document reader software for all of the major computer platforms (Windows, Unix, Macintosh, etc.). Thus, PDF documents that were created on a platform with Adobe PDF authoring software could be viewed by users of all the other participating platforms. Additionally, graphics, such as maps, could be converted into PDF. Furthermore, the Adobe Reader software provided for panning and zooming within the image on the computer screen, which overcame a potential limitation for the distribution of maps in this format—the relatively small size of most computer screens vis-a-vis a paper map. With the proper equipment, users also could print full-size copies of these maps from the PDF files.

Another computer-related development important to the dissemination of Census 2000 geographic products was the widespread use of the high-capacity digital versatile disc (DVD). A single DVD can store the images in PDF of thousands of large-format maps, such as census block and census tract maps. This allowed easy access to the tens of thousands of maps produced from Census 2000 that could be stored on discs requiring only a few inches of shelf space, which made it practical for individuals or libraries to own complete sets of all decennial census map products. All Census 2000 geographic products were made available on the Census Bureau Web site as well

as on CD/DVD-ROMs created on demand. As noted below, some products also were produced commercially in print and/or on DVD. Maps that were not printed commercially could be purchased as plot-on-demand products from the Census Bureau.

Geographic Products Pertaining to the Redistricting Data Program

As directed by Public Law (P.L.) 94-171, the Census Bureau was required to provide each governor and the majority and minority leaders of each state legislature with Census 2000 population totals for counties, American Indian and Alaska Native areas, cities, towns, county subdivisions, census tracts, block groups, and blocks. The data were provided by race and ethnicity (Hispanic/Latino or not Hispanic/Latino) for the total population and for the population 18 years old and over.¹⁰² In addition to the population counts, the Census Bureau provided several geographic products to aid the states in carrying out their redistricting activities. Pursuant to P.L. 94-171, the tabulations (and associated products) had to be delivered to the states within 1 year of Census Day or by April 1, 2001, for Census 2000.¹⁰³ After delivery of these products to official state redistricting representatives was confirmed, the data were made available to the public on the Census Bureau's Web site.

Redistricting TIGER/Line® files. This data set is an extract from the Census Bureau's Topologically Integrated Geographic Encoding and Referencing (TIGER®) database.¹⁰⁴ It contains data (that is, coordinates) representing the positions of map features (for example, roads, streets, railroads, bodies of water, etc.) and boundaries of legal and statistical entities, along with selected attributes of the features and geographic entities (names, city-style address ranges, geographic codes, census feature class codes, and the like). It is typically used with GIS software to create maps or be used as the basis for geospatial analysis. In a redistricting activity, information in the database is used in conjunction with the census block population data and other information to divide a state into congressional districts (or other population-based entities) that meet legal representation requirements.

The Redistricting TIGER/Line files release was the first of a series of TIGER/Line files resulting from Census 2000. This version of the TIGER/Line files contained all the Census 2000 geographic and statistical entities except for the ZIP Code tabulation areas (ZCTAs), urbanized areas (UAs), and public use microdata areas (PUMAs). These files also lacked the updated address ranges based on final Census 2000 information. The address ranges were comparable to those in the 1999 TIGER/Line files. These omissions were not critical for redistricting purposes, and holding up the delivery of these files to await the availability of this information would have caused unacceptable delays for redistricting officials. Later versions of the TIGER/Line files contained this information.

Redistricting map products. Despite the availability of GIS and specialized redistricting software, many redistricting officials use paper maps in addition to the TIGER/Line files. The Census Bureau fulfilled these requests by delivering paper copies of the maps and/or electronic map image files that the user could print as needed.

Prior to release of the redistricting products, the Census Bureau's Redistricting Data Office (RDO) canvassed official redistricting contacts in each state to determine the map format they desired. The options included paper copies, PDF map image files, and HPGL/2 plot files. The HPGL/2 is a proprietary format used by large-format plotters that allows for relatively fast map printing. Using maps plotted from HPGL/2 files supplied by the Geography Division (GEO), the Census 2000 regional census centers produced and shipped paper copies of the maps to redistricting contacts who requested them. The RDO provided CD-ROMs or DVD-ROMs with PDF and/or HPGL/2 versions of the map files to those redistricting contacts who requested digital versions of the maps.

¹⁰²As mentioned in the "Principal Data Products" section, redistricting data are also provided to the District of Columbia and Puerto Rico.

¹⁰³13 U.S.C. § 141(c).

¹⁰⁴For more information about TIGER, see Chapter 7, "Census Geography and the Geographic Support System."

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- P.L. 94-171 county block maps—For each county or statistically equivalent geographic entity, Census Bureau block maps show the greatest detail and most complete set of geographic information. These large-scale, large-format maps (36 by 33 inches) depict the smallest geographic entities for which the Census Bureau presents data—census blocks—by displaying the features that form block boundaries and the numbers that identify them. The intent of this map series is to produce a map for each county on the smallest possible number of map sheets, at the maximum practical scale. The maps show boundaries, names, and codes for American Indian/Alaska Native areas and Hawaiian Home Lands, county subdivisions, census places, voting districts, census tracts, block groups, and census blocks. Base-feature details, such as roads, railroads, and water features, also are shown. Approximately 95,500 unique map sheets were produced for this series.
 - P.L. 94-171 voting district/state legislative district outline maps—These county-based maps (36 by 33 inches) show the boundaries and codes for voting and/or state legislative districts as delineated by the participating states in Phase 2—the Voting District Project—of the Census 2000 Redistricting Data Program. They include the features underlying these boundaries and the names of these features. They also show the boundaries and names of American Indian/Alaska Native areas, Hawaiian Home Lands, counties, county subdivisions, and places. The maps were available only to those states and counties that participated in the Voting District Project. Approximately 16,000 unique map sheets were produced for this series.

Other TIGER® Extracts and Map Products

Census 2000 TIGER/Line® files. In the 2 years after the Redistricting TIGER/Line files became available, the Census Bureau released to the public three additional versions of Census 2000 TIGER/Line files so that important new geographic areas could be available to the public as soon as they were delineated. The “flow” basis of these releases resulted from the varying lengths of time required to complete the analytical processes involved in delineating these areas. Each release built on information in the earlier release. These multiple releases were practical and cost-effective only because of the availability of the Census Bureau Web site to allow free downloading of the files and the Census Bureau’s ability to easily copy and distribute files on CD/DVD-ROMs on an as-needed basis as customers ordered them. In the past, each release required that discs be sent to commercial establishments for reproduction, with the expectation that a minimum of several hundred sets would be produced.

The first (October 2001) of these releases, titled “Census 2000 TIGER/Line Files,” added improved address-range data based upon the addresses used for tabulating Census 2000. It also added ZCTA geography. The second (June 2002) release was the “UA Census 2000 TIGER/Line Files.” It contained the Census 2000 UAs, urban clusters (UCs), and PUMAs. The final (March 2003) release in the series was the “108th Congressional District Census 2000 TIGER/Line Files.” These files contained the congressional districts for the newly drawn 108th Congress. They also included the corrected Census 2000 UAs and the redefined 1990 UAs based on the Census 2000 urban and rural criteria.

Census 2000 boundary files. The Census Bureau produced a series of digital files (provided in three different formats) containing the lines that made up the boundaries of almost every level of geographic area for which Census 2000 data were produced. The Census Bureau developed the files for various internal mapping projects and made them available to the general public on its Web site. The boundary lines were generalized (that is, exhibiting simplified shape detail) extracts of data from the Census Bureau’s TIGER geographic database and were designed for use with GIS or business mapping software. The Census Bureau produced these files for each level of geography from the census block group and above.

Census 2000 block and tract relationship files. The Census Bureau released a series of (fixed length, ASCII format) files to assist data users in comparing 1990 and 2000 data at the census block and census tract levels. The data contained in the relationship files were extracted from the Census Bureau’s TIGER database. The files were created for the 50 states, the District of Columbia, Puerto Rico, and the Island Areas.

The Census 2000 Block Relationship Files provided a tool to help data users determine how 1990 blocks related to Census 2000 blocks and vice versa. These files portrayed the following relationships between the 1990 and 2000 census blocks: 1990 tabulation blocks to 2000 collection blocks;¹⁰⁵ 1990 tabulation blocks to 2000 tabulation blocks; and 2000 collection blocks to 2000 tabulation blocks.

The tract relationship files (in previous censuses, this product was called a comparability file) showed how 1990 census tracts related to Census 2000 census tracts. The Census 2000 tract relationship files consisted of four sets of files. Two of these were state-level entity-based files. One provided a measurement of change based on population; a second measured change using street-side mileage. The other two files specifically listed census tracts that had experienced significant change: one file from the perspective of 1990 census tracts, the other from the perspective of Census 2000 tracts.

The relationship files did not provide users with specific information on which pieces of land were involved in any changes between 1990 and 2000. For that information, one would have to use GIS software to overlay both vintages of the boundaries together on a map.

Census 2000 block maps. These large-scale, large-format block maps (36 by 33 inches) had the same design and content as the block maps for the Redistricting Data Program except that they did not include voting district boundaries and were both based on counties and governmental units (whereas the Redistricting Data Program block maps were county-based only). The Census 2000 block maps were produced specifically for American Indian/Alaska Native areas, Hawaiian Home Lands, counties, county subdivisions, places, census designated places (CDPs), and consolidated cities. CDPs were included because of their place-like characteristics even though they are not governmental units.

To create the maps for these additional areas, the production process was repeated for each governmental unit across the nation. The map production system created a new sheeting arrangement for each place, using the fewest number of sheets of appropriately scaled maps that showed the area in question. Because of the way county areas were divided among map sheets, had the block maps been created at the county level only, users interested in maps for a particular place likely would have had to view (and possibly print) many map sheets that displayed only small pieces of the place. Remapping at the governmental-unit level usually greatly reduced the number of map sheets required for an individual place.

As a result of this effort, many areas of the country were mapped several times at the block level. Although the effort greatly increased the resource requirements for computer map production, it resulted in significant efficiencies for the map users. Approximately 185,000 individual map sheets were produced for this series. In addition to digital versions, paper copies of these maps, plotted only if requested, could be ordered from the Census Bureau.

Census 2000 tract maps. These large-format maps (36 by 33 inches) showed the boundaries and numbers of census tracts as well as the named features underlying the boundaries. They also showed the boundaries, names, and codes for American Indian/Alaska Native areas, Hawaiian Home Lands, counties, county subdivisions, and places. The scale of the maps was optimized to keep the number of map sheets for each area to a minimum, but the scale and number of sheets varied by the size of the area of the county and the complexity of the census tracts.

American Indian tribal census tract outline maps. American Indian tribal census tracts are small, relatively permanent statistical subdivisions of federally recognized American Indian reservations/off-reservation trust lands. The difference between a tribal census tract and a standard census tract is in the hierarchical presentation of the data. The Census Bureau includes an American Indian geographic hierarchy in data summaries that are presented for the entire United

¹⁰⁵ A collection block is a physical block enumerated as a single geographic area, regardless of any legal or statistical boundaries passing through it. A tabulation block, on the other hand, is so designated for publication purposes and cannot be split by the boundary of a legal or statistical entity for which the agency publishes data.

States, such as the final national summary files. In this hierarchy, data are presented for tribal census tracts, respecting the boundaries of the American Indian reservations/off-reservation trust lands, but data are presented without regard to county and state boundaries. As a result, a census tract that crosses the boundary of an American Indian reservation in the standard geographic hierarchy may have a different population and housing unit count than that presented for what may appear to be the same census tract in the American Indian hierarchy. The tribal census tract outline maps showed the boundaries for the tribal census tracts, which use the American Indian geographic hierarchy in the presentation of the associated data.

These large-format maps (36 by 33 inches), created only in PDF format, showed the boundaries and numbers of the American Indian tribal census tracts as well as the named features underlying those boundaries for American Indian reservations and off-reservation trust lands. The scale of the maps was optimized to keep the number of map sheets for each area to a minimum, but the scale and number of sheets varied by the size of the area of the American Indian reservation/off-reservation trust land and by the complexity of the associated tribal census tracts.

Census 2000 county and county subdivision outline maps. These state-based maps (produced in black and white for a page-size format) showed the names and boundaries of counties and statistically equivalent areas; and counties, county subdivisions, places, consolidated cities, American Indian/Alaska Native areas, and Hawaiian Home Lands, respectively. The Census 2000 boundaries shown were those legally in effect as of January 1, 2000. The county outline maps consisted of a single map of each state, the District of Columbia, Puerto Rico, and the Island Areas. The Island Areas also were included in the county subdivision outline map series.

Census 2000 urbanized area (UA) and urban cluster (UC) outline maps. These large-format maps showed the boundaries, names, and codes of UAs and UCs, respectively, as well as the named features underlying the boundaries. They also showed the boundaries, names, and codes for American Indian/Alaska Native areas, Hawaiian Home Lands, counties, county subdivisions, and places. The maps represent UAs and UCs as reported in the May 1, 2002, *Federal Register* notice and do not reflect corrections provided in the *Federal Register* notice of August 23, 2002.¹⁰⁶

Congressional district products. The Census Bureau produced tables and maps that reflected the boundaries and geographic relationships of congressional districts for the 108th Congress. These districts were established by the states based on the Census 2000 P.L. 94-171 data. Except for the seven states with only one representative and Maine, which redistricted in the spring of 2003, all states established new congressional district boundaries by 2002. There were three map types available: individual congressional district wall maps, state-based congressional district wall maps, and a national congressional district wall map. Only the latter was published in paper format for sale. The other maps, as well as the national map, were made available for downloading in PDF and GIF formats from the Census Bureau Web site. Additionally, all three map types were contained in a single digital product—available on DVD—called *The 108th Congressional District Atlas*. This product also included the above-mentioned tables, which were state-based and reflected the relationships of the congressional districts to geographic entity types specific to each state.

Public use microdata area (PUMA) maps. As described in the “Principal Data Products” section of this chapter, the Census Bureau produced public use microdata sample (PUMS) files containing the actual responses (subject to disclosure avoidance techniques) to census long-form questionnaires. Working with these microdata files, data users could prepare their own customized tabulations and cross tabulations of responses to most population and housing subjects. The records did not contain identifying information such as names and addresses, and they were geocoded to large geographic areas to protect respondent confidentiality. These areas are known as public use microdata areas or PUMAs. Two types of PUMAs were created: PUMAs and super

¹⁰⁶ *Federal Register*, Vol. 67, No. 84 (May 1, 2002), pp. 21962–67; Vol. 67, No. 164 (August 23, 2002), pp. 54630–31.

PUMAs. PUMAs had to have a minimum census population of 100,000 and could not cross state lines. The PUMAs were aggregated into super-PUMAs, which required a minimum population of 400,000. PUMA maps were created to show the boundaries of these areas.

Two page-size map series were produced, one each for super-PUMAs and PUMAs. The super-PUMA maps were state-based and depicted super-PUMA boundaries and codes, state boundaries, and county boundaries and names. The PUMA maps were based on the corresponding super-PUMAs and displayed the boundaries and codes of the component PUMAs within the super-PUMA. Additionally, the maps showed county boundaries and names along with census tract boundaries within the boundary of the super-PUMA.

1990 census small area maps (re-created). As noted above, technological changes greatly hampered the Census Bureau's ability to provide customers with maps from the 1990 census in the later years of that decade. For customers interested in comparing 1990 and 2000 census results for small areas, this presented major difficulties. With this in mind, the Census Bureau decided to use the 2000 map production system and the 1990 geography from the TIGER database to create maps that closely approximated the 1990 census tract/block numbering area (BNA) and block maps.

- **1990 census block maps (re-created)**—These maps, created in PDF format, were produced for counties only. The maps displayed the 1990 geography; however, the features displayed on these maps were those shown on Census 2000 maps. These large-format maps (36 by 33 inches) showed the boundaries and numbers of the 1990 census blocks as well as the named features underlying the boundaries. They also showed the boundaries, names, and codes for the 1990 American Indian/Alaska Native areas, counties, county subdivisions, and places.
- **1990 census tract/BNA maps (re-created)**—These maps were re-creations of the 1990 census tract/BNA outline maps and differ from the original 1990 census tract outline maps. Similar to the Census 2000 tract outline maps, these maps were county-based and were created for all 1990 counties/county equivalents in the United States. As with the re-created 1990 census block maps, these maps displayed the 1990 geography, but the features are those shown on Census 2000 maps. They show the boundaries and numbers of the 1990 census tracts/BNAs as well as the named features underlying those boundaries. These maps also showed the boundaries, names, and codes for 1990 American Indian/Alaska Native areas, counties, county subdivisions, and places.

Map Products Pertaining to Characteristic Data

Census 2000 population profile maps. These profile maps presented, in color, a graphic overview of several demographic statistics collected as part of Census 2000. Each page included a population density map by census tract; a pie chart showing racial characteristics; a population pyramid; and a bar chart illustrating housing occupancy rates.

The map series consisted of one page-sized map for each state, the District of Columbia, and Puerto Rico, as well as a national map. These maps were designed to supplement the Census 2000 profiles. (See the "Principal Data Products" section of this chapter.) Each map appeared as part of a Census 2000 Profile brochure, which also included tables summarizing selected demographic, social, economic, and housing characteristics.

Mapping Census 2000: The Geography of U.S. Diversity. This Census 2000 Special Report (CENSR/01-1) presented, in atlas format, a synthesis of the basic patterns and changes in U.S. population distribution in the last decade. It was available as a printed report and in PDF format on the Census Bureau Web site. Each page featured county-level detail for the 50 states, the District of Columbia, and Puerto Rico. Each page also included a small, state-level map for a simplified view of the population theme. The Census 2000 data in this report were based on the Census 2000 Redistricting Data Summary File.

American Indians and Alaska Natives in the United States map. This wall map showed the American Indian and Alaska Native areas reported and/or delineated for Census 2000. The map contained graphics reflecting Census 2000 data for the populations living in these areas. This color map (48 by 36 inches) was available in print, as well as digitally in both PDF and GIF formats.

Population center and population distribution maps. The population center map series consisted of three page-sized color maps depicting the center of population based on Census 2000 and previous censuses. The three maps were “Position of the Geographic Center of Area, Mean and Median Centers of Population 2000,” “Mean Center of Population for the United States: 1790 to 2000,” and “Median Center of Population for the United States: 1880 to 2000.”

The “Census 2000 Population Distribution in the United States” map depicted the distribution of the U.S. population using white “dots” against a dark blue background. It was commercially published in wall-size and page-size versions, and the page-size version was also available in PDF format on the Census Bureau Web site. On the wall-size version of the map, each white “dot” represented 1,000 people; whereas on the page-size version, each one represented 7,500 people. The agency published population distribution maps in this same presentation format following the 1980 and 1990 censuses, and it remains one of the Census Bureau’s most popular thematic maps.

Census Atlas of the United States. In January 2008, the Census Bureau released this publication—the first comprehensive atlas of population and housing produced by the agency since the 1920s—as part of the Census 2000 Special Report series. It was a large-format, 300-page, 7-pound publication containing almost 800 maps. Most of the maps and accompanying information pertained to Census 2000, but the *Census Atlas* included data from 1790 (the first census) to 2000, and data from decennial censuses prior to 2000 supported nearly 150 maps and figures, providing context and historical perspective for many of the topics presented.

A variety of topics were covered in the *Census Atlas*, ranging from language and ancestry characteristics to housing patterns and the geographic distribution of the population. A majority of the maps in the publication presented data at the county level for the United States and Puerto Rico, but data were also mapped by state, census tract (for the largest cities and metropolitan areas), and for selected American Indian reservations.

The large-format, bound version of the *Census Atlas of the United States* is available for purchase from the Government Printing Office’s online bookstore, or a PDF version of the publication can be downloaded from the Census Bureau’s Web site.

DATA PRODUCTS PERTAINING TO SPECIAL POPULATIONS

As part of its preparations for Census 2000, the Census Bureau designed special procedures for enumerating those segments of the population for which the lack of conventional housing might preclude their being counted in the major enumeration operations.

In an operation called “service-based enumeration” (SBE), the Census Bureau counted people at facilities where they received services. Included were such places as shelters, soup kitchens, and regularly scheduled mobile food van stops. Additionally, the SBE counted people at targeted non-sheltered outdoor locations (TNSOLs), such as encampments beneath bridges.¹⁰⁷

Operation and Methodology

The Census Bureau conducted the SBE from March 27 through March 29, 2000, with specific components including emergency and transitional shelters (code 701); shelters for children who are runaways, neglected, or without conventional housing (code 702); shelters for abused women (or shelters against domestic violence) (code 703); soup kitchens (code 704); regularly scheduled mobile food van stops (code 705); and TNSOLs (code 706).¹⁰⁸ Additionally, respondents who completed Be Counted forms (BCFs) and checked the “no address on April 1, 2000” box or indicated in the address section that they were homeless were tabulated as part of the SBE population and were allocated to a service location in the city and/or county indicated on the BCF.¹⁰⁹

¹⁰⁷ The SBE is described in more detail in the Group Quarters Enumeration section of Chapter 5, “Data Collection.”

¹⁰⁸ The referenced codes were used in the tabulation of the data and also provide a shorthand way of referring to the various components of the SBE.

¹⁰⁹ The Be Counted campaign is described in Chapter 5 under the section entitled “Supplemental Campaigns.”

Because Census Bureau enumerators visited the service locations only once during the enumeration period, a method was needed to account for those people who used the service facilities, but did not do so on the day that the Census Bureau visited. The agency developed a “multiplicity estimator” to account for those other people. However, because apparent response bias in the answers to the frequency-of-use question on the service facility questionnaires affected the reliability of data based on the multiplicity estimator, the Census Bureau decided not to use that methodology to refine the data obtained through the enumeration of the service facilities.¹¹⁰ Thus, the data obtained through the enumeration of components 701 through 705, without multiplicity estimation, were combined with the TNSOL data and the BCFs indicating no address or “homeless” in the noninstitutional group quarters counts for Census 2000, so that data from the SBE or any of its components were not shown separately in the initial release of these data (see additional discussion below).¹¹¹

The decision not to use the multiplicity estimator affected the Census Bureau’s plans regarding the dissemination of data from the Census 2000 SBE. The following sections describe the original dissemination plans and the changes to those plans including a discussion of how the data from the SBE were aggregated for publication purposes and specific data products produced for components of this population.

Original Plans for the Dissemination of SBE Data

The plans and procedures for counting and producing tabulations of people without conventional housing were presented at numerous meetings and public forums leading up to Census 2000. They were developed based on advice received throughout the decade from census stakeholders, such as the census advisory committees and the National Coalition for the Homeless, among others. In particular, in its January 1999 final report, the Census 2000 Advisory Committee recommended that special attention be paid to tabulation plans for the results from service facilities and targeted outdoor locations so that they could not be aggregated for use as a “homeless count.” Similarly, the National Coalition for the Homeless and other advocacy organizations urged the Census Bureau to avoid the confusion and misinterpretations of the data that occurred with the 1990 census Shelter and Street Night (S-Night) enumeration.¹¹²

From the 1990 S-Night operation, the Census Bureau published data showing the number of people enumerated at selected locations where homeless people could be found. Before, during, and after the 1990 census, the Census Bureau clearly conveyed to users that the S-Night operation was not intended to produce a count of the homeless population. Despite the Census Bureau’s description of the limitations of these data and its cautions about their use, stakeholders voiced

¹¹⁰ See the discussion of the SBE in the “Group Quarters Enumeration” section of Chapter 5. The Census Bureau had planned to incorporate the SBE data with multiplicity estimation in the Census 2000 data for all purposes except apportionment. (See U.S. Census Bureau, “Service-Based Enumeration in Census 2000: Multiplicity Estimation,” Census 2000 Decision Memorandum No. 100, February 22, 2000.) With regard to the SBE questionnaires used at the service facility locations, the Census Bureau evaluated responses to the question on frequency of use—information specifically used for the multiplicity estimator calculations—and found that a large proportion of the responses for the shelter questionnaires was inconsistent with reported usage patterns obtained from a review of the relevant literature. The Census Bureau determined that this level of apparent response bias—as well as a relatively high level of nonresponse to both the shelter and soup kitchen usage questions—rendered the data incorporating the multiplicity estimator unreliable and not useable. For additional information on the decision, see U.S. Census Bureau, Richard A. Griffin, DSSD, “Census 2000—Service Based Enumeration Multiplicity Estimation,” Census 2000 Procedures and Operations Memorandum Series B-15*, February 28, 2001, pp. 3–6. For more detailed information on the methodology of the multiplicity estimator, see Felipe Kohn, DSSD, “Census 2000 Service Based Enumeration: Overview of Multiplicity Estimation,” Census 2000 Procedures and Operations Memorandum Series Q-36, December 5, 2000.

¹¹¹ The frequency-of-use question only pertained to the service locations; it was not asked on the BCFs or at TNSOLs.

¹¹² S-Night was a census operation that took place during the evening hours of March 20 and the early morning hours of March 21, 1990. It was designed to count persons living in pre-identified public shelters (including those for abused women) and places of commerce such as bus or train stations, and persons visible on the streets. For a more detailed description of the operation, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part A*, 1990 CPH-R-2A (Washington, DC: U.S. Government Printing Office, 1993), pp. 6-52–6-53.

concerns about the meaning and appropriate use of these data throughout the decade.¹¹³ The misinterpretations of the data that occurred relative to the 1990 experience were key to the decision not to publish separate tabulations for all components of the Census 2000 SBE. Specifically, the Census Bureau planned to release separate data on emergency and transitional shelters (including shelters for runaway children, that is, codes 701 and 702 combined) in Summary File 1 (SF 1), but no separate release of data for the other SBE locations. This dissemination plan was documented in an April 1999 interdivisional memorandum and made available to census stakeholders.

Change to the Original Plans for the Dissemination of SBE Data

In January 2001, the Census Bureau changed its earlier decision to release in SF 1 the data from emergency and transitional shelters because the agency believed the multiplicity estimator-based data were clearly unreliable. This change was based on the Census Bureau's increasing concerns that the census results—given that the multiplicity estimator could not be used to refine the data—of people enumerated at emergency and transitional shelters, without the appropriate qualifiers and other discussions of the limitations of the data, would be misinterpreted. During this time, the Census Bureau also determined that including the limitations and qualifiers in the technical documentation was not possible within the deadlines for releasing SF 1. According to the Government Accountability Office (GAO), some data users saw the decision as an attempt to suppress the shelter data.¹¹⁴ Rather, the Census Bureau decided it would issue a special report later in the year on the results of the enumeration of emergency and transitional shelters, with the appropriate caveats. Thus, with the release of SF 1 data beginning in June 2001, the data from the SBE were reported in aggregate in the “other noninstitutional group quarters” category. This category included persons in other types of living arrangements (for example, staff residents of institutions and living quarters for victims of natural disasters) in addition to those enumerated in the SBE.

Responses to the Census Bureau Decision

Following the Census Bureau's release of the first SF 1 data files in June 2001, considerable discussion occurred in the press, among Census 2000 partners, and in the Congress about the lack of separate reporting categories for the SBE data. On July 3, 2001, Rep. William Lacy Clay, Jr. (D-MO), the ranking member of the House Subcommittee on the Census, and Reps. Carolyn B. Maloney (D-NY) and Dennis J. Kucinich (D-OH), wrote to Acting Census Bureau Director William G. Barron, Jr., expressing their concerns that “. . . the Census Bureau has changed the procedure for the release of information collected during . . . service based enumeration.”¹¹⁵ In a July 23, 2001, follow-up letter signed by Reps. Maloney and Kucinich and 17 additional members of Congress, the representatives requested the release of data from the SBE, including data pertaining to the TNSOLs, “. . . at the lowest level of geography available, at the earliest possible date.”¹¹⁶ The representatives stated that:

. . . officials from local governments across this nation invested valuable time and resources in working with the Bureau to collect these data. For some communities, the Service Based Enumeration provides a valuable indicator of the population in need of

¹¹³ The National Law Center on Homelessness and Poverty filed a suit challenging the procedures and results of the 1990 census S-Night. The plaintiff claimed that the 1990 count of people living in shelters or present at preidentified street sites was “. . . so arbitrarily limited in scope and deficient in execution as to be useless as a count of even a segment of the homeless population.” As relief, the plaintiff sought, among other things, a recount of the “homeless” population using sampling and estimation techniques and the incorporation of those results in the 1990 census counts, as well as the use of similar techniques to count the “homeless” in the 2000 census. This 1990 census lawsuit, *National Law Center on Homelessness and Poverty v. Kantor* (No. 94-5312, 1996 WL 446791 (D.C. Cir. Aug. 9, 1996)), is discussed in more detail in the “Litigation” section of Chapter 11, “Legal Issues.”

¹¹⁴ U.S. General Accounting Office, “Decennial Census—Methods for Collecting and Reporting Data on the Homeless and Others without Conventional Housing Need Refinement,” Report to Congressional Requesters, GAO-03-227, January 17, 2003, p. 2. By legislation enacted into law in July 2004, the name of the entity was changed to Government Accountability Office. Copies of GAO reports can be obtained from its Web site at <www.gao.gov>.

¹¹⁵ Rep. William Lacy Clay, Jr. et al, U.S. House of Representatives, to William Barron, Jr., Acting Director, U.S. Census Bureau, July 3, 2001.

¹¹⁶ Rep. Carolyn B. Maloney et al, U.S. House of Representatives, to William Barron, Jr., Acting Director, U.S. Census Bureau, July 23, 2001.

service. For other communities, where shelters and soup kitchens are less predominant, the Targeted Non-Shelter Outdoor Location counts are more useful. Local governments expected that these data would be released so that they could make informed decisions on how to address problems in their communities.¹¹⁷

The letter concluded by noting that if these data were not made available to local governments, these entities would be less likely to work collaboratively with the Census Bureau on future projects.

The Census Bureau responded by noting the January decision not to release the shelter data as part of SF 1 and informed the members about a planned special report on that population to be released in October 2001. However, the agency clearly stated that it did not intend to release other component data from the SBE. It provided the members with numerous planning documents developed over the decade testifying to the agency's intent not to release separate tabulations of people lacking conventional housing or tabulations of all the individual components of the SBE.¹¹⁸

Data Products on the Emergency and Transitional Shelter Population

In the fall of 2001, the Census Bureau published its special report on the emergency and transitional shelter population.¹¹⁹ At approximately the same time, the agency also produced a public use data table containing, among other data, counts for counties and tracts with 100 or more people in emergency and transitional shelters.¹²⁰ These documents presented data for SBE components 701 and 702 combined. The data for the other SBE components (703–706) were not reported separately, but were included in aggregate (combined with the data for codes 701 and 702) in SF 1 tabulations of the “other noninstitutional group quarters” population.¹²¹

GAO Releases Report Evaluating the SBE

In January 2003, GAO released a report examining the Census 2000 SBE and the Census Bureau's decision processes regarding the release of data collected in that operation.¹²² The GAO noted that the Census Bureau partnered with local governments and community advocacy groups to obtain lists of service locations and to obtain their assistance in conducting the SBE. According to the report, because the Census Bureau did not always communicate clearly and consistently to its partners and the public regarding its plans for disseminating data from the SBE, misunderstandings and expectation gaps developed regarding what component data would be disseminated.¹²³ For example, the assistant city attorney of Los Angeles stated she believed the city would receive the TNSOL data—given the city's extensive efforts to identify TNSOL locations for the Census Bureau—that city officials wanted for resource allocation purposes.¹²⁴ However, the GAO also acknowledged that the Census Bureau was faced with competing demands from various stakeholders (government entities, service providers, and advocacy groups) regarding how the data should be published. That is, some of these stakeholders did not want any SBE component data released and were displeased with the separate release of the emergency and transitional shelter data.¹²⁵

¹¹⁷ Ibid.

¹¹⁸ William G. Barron, Jr., Acting Director, U.S. Census Bureau, to Rep. William Lacy Clay, Jr., U.S. House of Representatives, August 10, 2001, pp. 1–2.

¹¹⁹ U.S. Census Bureau, Annetta C. Smith and Denise I. Smith, “Emergency and Transitional Shelter Population: 2000,” Census 2000 Special Reports, CENSR/01-2, October 2001.

¹²⁰ “Population in Emergency and Transitional Shelters,” Census 2000 PHC-T-12, October 30, 2001. This data table and the preceding Census 2000 Special Report are both available on the Census Bureau Web site at <<http://www.census.gov/population/www/cen2000/briefs.html#sr>>.

¹²¹ The only exception was the availability of a national-level count of those enumerated at TNSOLs. See “Census 2000—Service Based Enumeration Multiplicity Estimation,” February 28, 2001, p.5.

¹²² “Decennial Census—Methods for Collecting and Reporting Data on the Homeless and Others without Conventional Housing Need Refinement,” January 17, 2003.

¹²³ Ibid., pp. 13–14.

¹²⁴ Ibid., p. 12. In fact, the city of Los Angeles later filed a Freedom of Information Act (FOIA) lawsuit in which it sought the SBE component data separately reported at the census tract or lower level of geography for Los Angeles County (*City of Los Angeles v. U.S. Department of Commerce*, CV 02-9122WMB (C.D.Cal. Aug. 27, 2004)). The FOIA request and ensuing lawsuit are discussed in the relevant sections of Chapter 11.

¹²⁵ Ibid., pp. 12–13.

The GAO cited the Census Bureau's lack of well-documented, transparent, clearly defined, and consistently applied guidelines on the minimum quality necessary for releasing data as a key cause of the agency's "shifting" position on the dissemination of SBE data. Finally, with regard to the multiplicity estimator, the GAO inferred that had appropriate testing been conducted during the decade, the problem with the methodology that surfaced in Census 2000 would have been revealed. The GAO stated that the Census Bureau believed that the sample sizes of the relevant populations in the 1998 Dress Rehearsal sites were not large enough to adequately test the methodology.¹²⁶

To incorporate lessons learned in the planning for the 2010 Census, the GAO recommended that:

- The Census Bureau ensure that all procedures for enumerating and estimating segments of the population without conventional housing are properly tested and evaluated under conditions as similar to the census as possible.
- The Census Bureau develop agencywide guidelines for its decisions on the level of quality needed to release data to the public, how to characterize any limitations in the data, and when it is acceptable to suppress the data for reasons other than protecting the confidentiality of respondents. It further recommended that the Census Bureau ensure that these guidelines are documented, transparent, clearly defined, and consistently applied.¹²⁷
- The Census Bureau ensure that its plans for releasing data are clearly and consistently communicated with the public.¹²⁸

Census Bureau Response to GAO Report

The Census Bureau agreed with the report's recommendations, but took issue with GAO's findings pertaining to (1) the Census Bureau's "shifting" position regarding how data from the SBE would be disseminated, and (2) the consistency with which the agency communicated its dissemination plans for the SBE data. The Census Bureau stated that its ". . . position on releasing SBE figures was entirely consistent and well publicized." It further noted that the only change to the dissemination plans was the delay in releasing the emergency and transitional shelter data and that the decision to delay the release of these data as a separate tabulation was ". . . entirely consistent with the Census Bureau's commitment to releasing data only after ensuring that they meet minimum quality guidelines."¹²⁹

With regard to GAO's second recommendation, the Census Bureau noted that, independent of the report's findings and recommendations, it was undertaking a review of its data quality guidelines. Specifically, the Methodology and Standards Council,¹³⁰ under the direction of the associate director for Methodology and Standards, was charged with reviewing the agency's statistical and quality guidelines for surveys and censuses. To further this work, and to ensure an agencywide approach, the Methodology and Standards Council formed an inter-directorate quality framework working group. At the time GAO issued its reports, this group was in the initial stages of its work.

Implications for the 2010 Census

The Census Bureau's own evaluation of the SBE found it to be a successful program and recommended implementation of a similar program in the 2010 Census to enumerate segments of the

¹²⁶ Ibid., p. 9.

¹²⁷ GAO also conducted a study of the Census Bureau's decision to release "questionable" Hispanic subgroup data from Census 2000 and made a practically identical recommendation in that report. The Census Bureau disagreed with GAO's characterization of the process for assessing the quality of the data as well as the quality of the data themselves. See U.S. General Accounting Office, "Decennial Census—Methods for Collecting and Reporting Hispanic Subgroup Data Need Refinement," Report to Congressional Requesters, GAO-03-228, January 17, 2003, p. 21.

¹²⁸ "Decennial Census—Methods for Collecting and Reporting Data on the Homeless and Others without Conventional Housing Need Refinement," January 17, 2003, pp. 16–17.

¹²⁹ Ibid., p. 21.

¹³⁰ The Methodology and Standards Council advised the program associate directors on policy and issues affecting research and methodology for Census Bureau programs. Among other things, the council ensured sound survey and census program methodology and practices, furthered research in all areas in support of the agency's programs, and facilitated communication and coordination of statistical research and methodology throughout the Census Bureau.

population without conventional housing.¹³¹ The evaluation noted that those individuals enumerated in the SBE were likely to have been missed otherwise, and a large percentage (nearly 60 percent) of the emergency and transitional shelter population reported one or more races other than White.¹³² Thus, the operation provided a successful means of enumerating hard-to-count portions of minority populations. Based on the results from Census 2000, the Census Bureau does not plan to use multiplicity estimation in its service-based enumeration in the 2010 Census.

With regard to GAO's recommendation relating to agencywide data quality guidelines, in April 2007, the Methodology and Standards Council issued "Quality Requirements for Releasing Data Products," the last of five quality standards issued by the council pertaining to Census Bureau data products.¹³³ This quality standard defines a set of public data release criteria and describes procedures for addressing the release of any data products based on surveys and censuses that do not meet these criteria. The Census Bureau expects that the standard will govern 2010 Census data releases.

SPECIAL TABULATIONS PROGRAM

Authorization

The Census Bureau's special tabulations program is authorized in Section 8(b), Title 13, U.S. Code:

Subject to the limitations contained in sections 6(c) and 9 of this title, the Secretary may furnish copies of tabulations and other statistical materials which do not disclose the information reported by, or on behalf of, any particular respondent, and may make special statistical compilations and surveys, for departments, agencies, and establishments of the Federal Government, the government of the District of Columbia, the government of any possession or area . . . , State or local agencies, or other public and private persons and agencies, upon payment of the actual or estimated cost of such work. . . .

Program Summary

Under the program, special tabulations are prepared from the data collected in censuses and surveys conducted under the authority of Title 13. The present discussion addresses the program only as it pertains to special tabulations produced from Census 2000 data; more than 290 special tabulations have been delivered based on these data. The Census Bureau produces special tabulations—when the appropriate criteria are met—for decennial census data users if standard data products do not meet their needs. The agency also produced special tabulations for the four censuses prior to Census 2000.

With the massive amount of Census 2000 data and helpful online tools available from the Census Bureau's Internet-based data dissemination system, the American FactFinder, (which includes electronic versions of all the standard decennial census data products), data users can now create some custom data products from these standard data files without the need for additional computer software or the programming knowledge required to use it. Creating these "custom" data products simply involves manipulating or reformatting existing data sets. The results are usually referred to as "extracts," and they differ from special tabulations. (See the discussion below about policy and terminology changes regarding these various products.)

¹³¹ U.S. Census Bureau, Tracey McNally, Service-Based Enumeration, Census 2000 Evaluation No. E.6, November 6, 2002, p. v.

¹³² Persons enumerated at shelters (including shelters for abused women) constituted 65 percent of the total number of people counted as part of the SBE. Ibid.

¹³³ In the interim, that is, since issuing its January 2003 reports, the GAO issued another report in November 2004 in which it recommended that the Census Bureau hasten its efforts to develop agency-wide data quality review standards to ensure that fully tested standards would be in place for the 2010 Census. See U.S. Government Accountability Office, "Data Quality—Census Bureau Needs to Accelerate Efforts to Develop and Implement Data Quality Review Standards," Report to Congressional Requesters, GAO-05-86, November 17, 2004, "highlights" section.

The Census Bureau creates special tabulations by using the underlying confidential (prepublication) detail files to produce requested tabulations.¹³⁴ Because special tabulations are created from confidential detail files, all requests for them must be approved by the Census Bureau's Disclosure Review Board (DRB).¹³⁵ To minimize the likelihood that data provided in a special tabulation could lead to the identification of a respondent (a violation of the confidentiality requirements of Title 13, U.S. Code), and because special tabulations can involve very small population subsets, the DRB requires the implementation of specific disclosure avoidance procedures, such as rounding or applying thresholds, for all such tabulations.

The data collected from the Census 2000 short- and long-form questionnaires are suitable for inclusion in a special tabulation, and the Census Bureau may calculate percentages, rates, or other indicators as part of the tabulation. In terms of geographic scope, special tabulations can be produced for standard census geographic entities, such as states (and state equivalents), counties, census tracts, American Indian and Alaska Native areas, etc., as well as for user-defined geographic areas.

Special tabulations carry no proprietary rights, so once a tabulation is produced and paid for by the sponsor, others can obtain the tabulation for the cost of reproduction (for example, copying it onto a CD or DVD). The Census Bureau maintains a list of special tabulations it has produced (including those pertaining to Census 2000 data). The list includes the names of requesters and brief descriptions of the tabulations; it is available upon request from the Office of Analysis and Executive Support.

Special Tabulations of General Interest

Although the Census Bureau does not post all special tabulations online, selected Census 2000 special tabulations that are of general interest are available. Examples of such special tabulations include: the Census Transportation Planning Package (CTPP), the Comprehensive Housing Affordability Strategy (CHAS) tabulation, the Voting Rights Determination File, and the Special Equal Employment Opportunity (EEO) File.

CTPP 2000 is the result of a cooperative effort among the American Association of State Highway and Transportation Officials (AASHTO), state departments of transportation, Census Bureau, Federal Highway Administration (FHWA), Bureau of Transportation Statistics (BTS), Federal Transit Administration (FTA), and the Transportation Research Board (TRB). CTPP is a special tabulation of responses from households completing the decennial census long form. It contains tabulations by PLACE OF RESIDENCE (Part I), PLACE OF WORK (Part II), and JOURNEY-TO-WORK (Part III). It is the only source of information with summary tabulations available for traffic analysis zones (TAZs) that have been defined by state and regional transportation agencies. These special tabulations are intended to provide data to support a wide range of transportation planning activities at the state and local levels.¹³⁶ Similar tabulations were produced following the 1990, 1980, and 1970 censuses.¹³⁷

The CHAS tabulation, sponsored by the U.S. Department of Housing and Urban Development (HUD) and released in the fall of 2003, is a detailed tabulation providing extensive short- and long-form data on households and housing units (tenure, household income, poverty status, year structure built, etc.) tabulated by HUD-defined variables such as HUD-adjusted median family income. The Census Bureau also provided HUD with a CHAS tabulation in connection with the 1990 Census Special Tabulations program.¹³⁸

The Voting Rights Determination File is a series of data files produced to support the Voting Rights Act Amendments of 1992. The file contains Census 2000 data used to create the mandated listing of jurisdictions requiring language assistance at polling areas. Under Section 203 of the Voting

¹³⁴ See the section of this chapter entitled "Prepublication Data Files" for additional discussion of these files.

¹³⁵ See footnote 49 for a brief description of the DRB's functions.

¹³⁶ CTPP 2000 also included a "national" tabulation.

¹³⁷ U.S. Census Bureau, *1990 Census of Population and Housing, History, Part B* (1990 CPH-R-2B) (Washington, DC: U.S. Government Printing Office, October 1995), p. 10–23.

¹³⁸ *Ibid.*

Rights Act, the Director of the Census Bureau must produce a listing of states and political subdivisions that are subject to the minority language assistance provisions of that section based on the established percentages of the jurisdiction's voting age citizens that fall within the specified criteria. This file is based on decennial census data on English language proficiency, educational attainment, citizenship, and age. If a jurisdiction is so designated, it must provide language assistance to language minority citizens so that they can participate in the electoral process. The Voting Rights Determination File, made available on the Internet in December 2004, is used to identify the jurisdictions subject to Section 203's requirements so that they can comply, and for enforcement purposes.

The Census 2000 Special EEO Tabulation, contracted and paid for by a consortium of four federal agencies,¹³⁹ is a special tabulation containing detailed occupation and education data by race, ethnicity (Hispanic/Latino or not Hispanic/Latino), and sex. It serves as the primary external benchmark for comparing the race, ethnicity, and sex composition of an organization's internal workforce with the analogous external labor market, within a specified geography and job category. Consequently, the file is used to monitor and/or challenge employment practices.

The Census 2000 Special EEO Tabulation, released in December 2003, contains information similar to comparable tabulations from the 1970, 1980, and 1990 censuses.¹⁴⁰ The tabulation consists of occupation and educational attainment information for 24 data sets made up of residential data, residence to worksite flow data, and worksite data. Of particular note are the data on occupation by age, occupation by industry, and occupation by earnings. The tabulation shows data for 471 census occupations, 268 Office of Personnel Management occupations, and 8 state and local government occupational categories. Data are provided at the national level, for states, the District of Columbia, county and county sets, metropolitan areas, and places and minor civil divisions of 50,000 or more persons.

Change in Policy Governing Special Tabulations and Extracts

In July 2004, it was revealed that in 2002 and 2003, the Census Bureau had provided tabulations of data on U.S. residents of Arab ancestry to federal law enforcement entities that later became the Bureau of Customs and Border Protection in the Department of Homeland Security (DHS). The specific data provided were the number of persons of Arab ancestry in places of 10,000 or more population and ZIP Code tabulation area (ZCTA)-level estimates of such persons.¹⁴¹ While these products were extracts of data publicly available on the Census Bureau's American FactFinder system, the fact that the data provided to the DHS focused on a particular ethnic group engendered significant media coverage.

In January of 2003, the Census Bureau had revised its policy criteria for determining when to accept requests for all reimbursable agreements, including special tabulations.¹⁴² These criteria included considerations such as whether the project was consistent with the Census Bureau's mission; whether "sensitive" populations¹⁴³ were the focus of the tabulation; and the impact on the agency's reputation of undertaking the project. Within this last category is a query regarding whether the requester is a government agency that conducts domestic law enforcement or regulatory activities. Also included in these criteria was the requirement that the sponsor or requester have adequate funds to pay the costs of producing the tabulation, given that, as noted above, the Census Bureau is directed to perform special tabulations on a cost-reimbursable basis.

¹³⁹The four federal agencies were the Equal Employment Opportunity Commission, the Department of Justice, the Department of Labor, and the Office of Personnel Management.

¹⁴⁰ However, unlike in previous censuses, the EEO tabulation in Census 2000 was not produced as a standard Census Bureau data product—but only as a special tabulation—due to budget considerations.

¹⁴¹ "Ethics, Confidentiality, and Data Dissemination," paper by Hermann Habermann, Deputy Director, U.S. Census Bureau, presented at the 55th session of the International Statistical Institute, Sydney, Australia, April 5-12, 2005, p. 2. Data on ancestry or ethnic origin, except for Hispanic origin, were only collected on the Census 2000 long-form questionnaire, which is distributed to a sample of approximately one in six housing units nationwide.

¹⁴² U.S. Census Bureau, "Reimbursable Project Acceptance Policy," Office of Analysis and Executive Support, DSEP Policy #DS-015, revised January 29, 2003.

¹⁴³ "The Reimbursable Project Acceptance Policy" (specifically, Attachment 3) defines "sensitive" populations as follows: "Includes children, cognitively impaired persons, comatose patients, the elderly, limited English-speaking or non-English-speaking persons, non-citizens, prisoners, impoverished and terminally ill patients, and small minority groups."

Responding to inquiries about the 2002 and 2003 data releases that pertained to Arab ancestry, the Census Bureau noted that because the products did not constitute special tabulations, the policy criteria discussed above (for accepting requests for special tabulations) were not applicable. However, the Census Bureau determined that it would be appropriate to review its policies regarding the production of special tabulations and data extracts.

Thus, in August 2004, the Census Bureau announced an interim policy for handling requests for special tabulations and data extracts.¹⁴⁴ In accordance with the interim policy, all requests for special tabulations would be reviewed under the Reimbursable Project Acceptance Policy, regardless of whether or not the cost of the work was reimbursed.¹⁴⁵ In addition, if the request was made by an intelligence agency or by a federal, state, or local law enforcement agency, and/or the data pertained to a “sensitive” population, the new policy required approval by the appropriate Census Bureau associate director before the request could be fulfilled.¹⁴⁶

In the case of extracts, requesters would be directed to obtain the data from the Census Bureau’s Web site, and the agency would provide assistance in using its Web-based tools. When this approach was not practical, the Census Bureau could fulfill the request, but requests from federal, state, or local law enforcement or intelligence agencies required prior approval from the appropriate Census Bureau associate director before the information could be released. The same approval was required if the data in question pertained to a “sensitive” population.¹⁴⁷

Following up on the interim procedures issued in August 2004, the Census Bureau, in October 2005, documented its policies regarding the production of “custom” tabulations (to include both special tabulations and extracts) pursuant to Section 8(b) of Title 13, U.S. Code.¹⁴⁸ Among other things, this policy statement expanded the definition of custom tabulations to include extracts requiring significant effort to be produced or that could not be easily produced by novice or casual data users. The new policy also noted specific procedures relating to the disclosure of the identities of requesters and descriptions of their custom tabulations upon a request from any interested party. Thus, requesters of custom tabulations (extracts and special tabulations) are provided the following statement: “The Census Bureau maintains a publicly available list of all custom tabulations that includes the names of the requesters and a brief description of the products. Once produced, custom tabulations also will be available upon request for the cost of reproduction.”

COUNT QUESTION RESOLUTION PROGRAM¹⁴⁹

The Census 2000 Count Question Resolution (CQR) was an administrative review program that provided jurisdictions a process to challenge, if desired, particular official Census 2000 counts of housing units and group quarters population in the United States and Puerto Rico.¹⁵⁰ The challenges could be submitted by local or tribal government officials or those acting on their behalf. CQR also included reviews, generated within the Census Bureau, of issues similar to those addressed in the external challenges.¹⁵¹ The program focused on the geographic misplacement of data collected in the census—it did not involve re-enumeration or adjustment of data. The Census

¹⁴⁴ Census Bureau News, “U.S. Census Bureau Announces Policy Regarding Sensitive Data,” press release CB04-145, August 30, 2004.

¹⁴⁵ The Census Bureau is not reimbursed when the special tabulation is statutorily required and sometimes is not reimbursed when it performs special tabulations for other government agencies.

¹⁴⁶ U.S. Census Bureau, “Procedures for Providing Assistance to Requestors for Special Data Products Known as Special Tabulations and Extracts,” memorandum for Associate Directors and Division Chiefs, Charles Louis Kincannon, Director, August 26, 2004.

¹⁴⁷ Ibid.

¹⁴⁸ U.S. Census Bureau, “Policy on Providing Custom Tabulations under Section 8(b) of Title 13, U.S.C.,” Office of Analysis and Executive Support, DSEP Policy #DS-021, October 20, 2005.

¹⁴⁹ The information in this section is summarized from U.S. Census Bureau, “Count Question Resolution Program,” Census 2000 Informational Memorandum No. 100, April 26, 2001.

¹⁵⁰ The Census Bureau had made a specific determination not to include the Island Areas (Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands) in the CQR program; see U.S. Census Bureau, “Count Question Resolution Program: Island Areas,” Census 2000 Informational Memorandum No. 93, January 29, 2001.

¹⁵¹ The Census Bureau internal review checked the Census 2000 counts for internal and intra-product consistency and for consistency with historical and external data sources.

Bureau identified the types of documentation local or tribal government officials—or their representatives—would have to provide for the Census Bureau to initiate the CQR process in response to a challenge or complaint. CQR was conducted from June 30, 2001, to September 30, 2003.

Scope of the Program

Similar to the CQR conducted for the 1990 census, the Census 2000 program was carried out to implement the following types of corrections (whether the errors were identified in internal reviews or jurisdictional challenges):

- **Boundary corrections**—The Census Bureau implemented boundary corrections in cases of inaccurate reporting or recording of state, local, or tribal government jurisdictional boundaries in effect as of January 1, 2000. The boundaries of other geographic or statistical areas (such as census designated places, tracts, etc.) were outside the scope of the Census 2000 CQR program.
- **Geocoding corrections**—These corrections pertained to the placement of living quarters and associated population within the correct jurisdictional boundaries (and correctly locating them in smaller geographies such as census tracts, block groups, and blocks). Even if the total count of a local or tribal jurisdiction did not change as a result of such corrections—for example, if housing units or group quarters were simply moved from one block to another within the same jurisdiction as a result of the CQR process—the Census Bureau still informed jurisdictions of such changes.
- **Coverage corrections**—These corrections involved the addition or removal of specific living quarters and persons residing therein that were identified during the Census 2000 process but were erroneously excluded or included due to processing errors.¹⁵² Addresses for those living quarters that were found to be erroneously excluded—but for reasons outside the scope of the CQR program—were added to the Census Bureau’s master address file (MAF) for use in future statistical programs.

The start date of the program was coordinated with the release dates of Summary File 1 (SF 1), which contained block-level population, housing unit, and group quarters population counts. SF 1 data were released on a state-by-state basis from June through August 2001.

In its program materials, the Census Bureau clearly stated that the CQR process would not collect new information. It also noted that the program was not a vehicle for states (or local jurisdictions) to challenge the counts of overseas federally affiliated households that were allocated to the states for purposes of apportionment. The administrative data the Census Bureau obtained to carry out the overseas counts program did not include information that would permit the allocation of these households to substate jurisdictions. In addition, the agency stated that corrections implemented in CQR would not result in changes to any of the Census 2000 prepublication data files nor to any of the data products, including the block-level redistricting data. However, boundary and geocoding corrections were reflected in the MAF and Topologically Integrated Geographic Encoding and Referencing (TIGER®) database.

Corrections implemented through CQR resulted in the issuance of revised official Census 2000 population and housing unit counts that were provided to the affected governmental entities. Additionally, the Census Bureau made the CQR-corrected data available on American FactFinder (AFF) and incorporated the revisions in the agency’s postcensal estimates program beginning in December 2002.

Results of the Program¹⁵³

The Census Bureau presented revised counts on its Web site for total population, group quarters population, total housing units, and vacant housing units down to the block level for the affected governmental units, including American Indian/Alaska Native areas and municipios in Puerto Rico.

¹⁵² In the “erroneously included” scenario, these could be housing units that were duplicated in the master address file.

¹⁵³ U.S. Census Bureau, 2000 Census of Population and Housing—Notes and Errata, (2000) SF/01-ER, p. 4 (PDF file with links to subsidiary data tables). This publication is available on the Census Bureau Web site at <<http://www.census.gov/dmd/www/CQR.htm>>.

At the national level, the revised population count for the United States as a result of corrections implemented through the CQR process was 281,424,603, as compared to the original count of 281,421,906. Most of the increase came from the group quarters population. In all, housing unit and group quarters population count changes affected a total of 1,183 governmental units.

MARKETING, USER SERVICES, AND DISSEMINATION

Marketing Services Office

Established in 1996, the Marketing Services Office (MSO) helps policymakers, businesses, non-profit organizations, academics, and the public learn about, access, understand, and use Census Bureau information. For Census 2000 and throughout the decennial cycle, MSO worked with partners who provided statistical information services, with the general public, and with other Census Bureau staff to disseminate information about programs, products, and services available from the agency. This office organized data user conferences, developed promotional materials, handled product sales, and conducted training sessions on access to and use of census data.

Customer Liaison Office

Also formed in the mid-1990s, the Customer Liaison Office (CLO) played a prominent role in the development and implementation of the Census 2000 Partnership Program. (See Chapter 4, “The Partnership and Marketing Program,” for additional information about this program.) CLO facilitated communication between Census Bureau staff and customers—state, local, and tribal governments and national nongovernmental organizations (NGOs)—and worked to provide access to data collected by the Census Bureau. CLO maintained two teams: State and Governmental Programs and Non-Governmental Programs.

State and Governmental Programs. In addition to working with state, local, and tribal governments and various governmental organizations (for example, the National League of Cities and U.S. Conference of Mayors) to keep them abreast of decennial census activities, Census Bureau program updates, and data product announcements, the State and Governmental Programs team conducted two major operations: (1) the State Data Center (SDC) and the Business and Industry Data Center (BIDC) programs and (2) the Governors’ Liaison Program.

In 1978, the Census Bureau created the SDC program to make census data available locally to the public through a network of state agencies, universities, libraries, and regional and local governments. In 1988, the agency added the BIDC program to meet the needs of local business communities for economic data. The SDCs provided easy and efficient access to Census Bureau data and information through a wide network of lead, coordinating, and affiliate agencies in each state. SDCs worked in partnership with the Census Bureau through CLO and the agency’s regional offices. Memoranda of agreement with each state, the District of Columbia, Puerto Rico, and the Island Areas supported this partnership.

The SDCs were official sources of demographic, economic, and social statistics produced by the Census Bureau. The agency made these data available to the SDCs at no charge, and the SDCs made these data accessible to state, regional, local, and tribal governments and to non-governmental data users at no charge or on a cost-recovery or reimbursable basis. SDCs also provided training and technical assistance in accessing and using Census Bureau data for research, administration, planning, and decision making by local governments, the business community, and other interested data users.

The SDC network supported Census 2000 activities by providing training for their subordinate organizations as well as for the public. They conducted informational meetings for affiliate SDC/BIDC personnel and promoted training activities for their local data user communities.¹⁵⁴ Activities to support decennial census operations included:

¹⁵⁴ Renee Jefferson-Copeland, “State Data Center & Business and Industry Data Center Network, 2001 Annual Report,” submitted to the State Data Center/Business and Industry Data Center Network, October 2001.

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- Conducting about 740 general information workshops.
 - Initiating or promoting roughly 2,400 Census 2000 activities through the preparation of flyers, public service announcements, and advertisements.
 - Preparing about 4,700 newsletter articles and press releases.
 - Conducting about 300 training workshops for data users.
 - Providing data, information, and training to approximately 15,000 data users.
 - Testing software for Census 2000 summary file CD-ROMs.

Established in 1997, the Governors' Liaison Program was a partnership between the governor of each state and the Census Bureau to work together to increase participation in Census 2000 and improve its accuracy. This program developed lines of communication between the Census Bureau's CLO and the governors to exchange information and provide updates of census activities and programs taking place in their states.¹⁵⁵ During Census 2000 and after, the Governors' Liaison Program alerted each governor to census activities such as data collection, data delivery, census planning, and geographic programs, including the Boundary and Annexation Survey and boundary updates to school districts and congressional districts.¹⁵⁶

Non-Governmental Programs. CLO's Non-Governmental Programs team coordinated two programs: the Non-Governmental Communications Program and the Census Information Center (CIC) program. The former program entailed communicating with national NGOs to keep them informed about decennial census activities, Census Bureau program updates, and data product announcements.

Additionally, the Non-Governmental Programs team played a significant role in the development and implementation of the Census 2000 Partnership Program. For example, members of the team served on the NGO Conference Steering Committee and thus were heavily involved in planning for the May 29, 1997, National Conference on Census 2000 Partnerships, which was held at the University of Maryland-College Park in College Park, MD. This conference was the first of its kind and very successful—attended by nearly 200 leaders from a broad array of NGOs.

The Non-Governmental Programs team was also involved in developing lists of potential partners and then working with numerous NGOs in the final partnership efforts. Formal endorsements were achieved with about one-third of these organizations. Another third supported Census 2000, but did not offer formal, written endorsements; however, these entities provided resolutions, video statements, and other informal endorsements.

A large number of the NGOs that endorsed or otherwise supported Census 2000 included labor unions, umbrella organizations, and constituency groups. Members of the Non-Governmental Programs team made presentations to numerous conventions and meetings of these (and other) organizations and handed out over 30,000 Census 2000 promotional kits and hundreds of thousands of census informational documents. Additionally, these team members participated in many workshops and panel presentations held and/or sponsored by these NGOs.

Founded in 1988, the CIC program was a partnership between the Census Bureau and 58 non-profit national and community-based organizations, including national NGOs, minority colleges and universities, research groups and think tanks, minority chambers of commerce, civil rights and social justice organizations, and groups serving children and rural populations, and one tribal government. CIC provided local access, education, and technical assistance on census data for planning and decision-making by underserved communities.

At the time of Census 2000, the CIC program expanded to 59 organizations and abandoned the "lead/affiliate" structure of the SDC program. Prior to Census 2000, five nonprofit organizations assumed the role of lead organizations. These organizations had a total of 31 affiliate organizations, some of which became CICs in the 2000 expansion. In addition to the services described

¹⁵⁵ Each state and the District of Columbia named a Census 2000 liaison.

¹⁵⁶ U.S. Census Bureau, "Governors Liaisons" at <<http://www.census.gov/sdc/www/liaisons.html>>.

above, with regard to Census 2000, these organizations assisted the Census Bureau in much the same way as the NGO partners did. (For more information on these functions, see Chapter 4, “The Partnership and Marketing Program.”) As CICs, they already had joint agreements with the Census Bureau and thus were committed to a successful census that provided accurate data to their user communities.

ARCHIVING OF DATA PRODUCTS AND RELATED RECORDS

The principal data products from Census 2000, and similar products from past censuses, are federal agency records with enduring historical value. As such, they are scheduled for transfer to the National Archives and Records Administration (NARA) for permanent retention. This section discusses the scheduling and planned transfer of Census 2000 data products and other electronic files. Also examined here are changes to these plans that occurred because these data products did not incorporate a statistical adjustment based on the results of the Accuracy and Coverage Evaluation (A.C.E.) program, as was initially anticipated.¹⁵⁷ The decisions not to incorporate a statistical adjustment in the Census 2000 data products affected not only the production of the data products themselves but, in the case of the sample (long form) data, the production of the underlying detail file as well.

Additionally, this section discusses the archiving of individual census records from Census 2000. Although technically not constituting a data product, these records are the most widely used among all decennial census records. A variety of users consult the records for genealogical and other research purposes when they are released to the public by NARA 72 years following the relevant Census Day.¹⁵⁸ In addition, the Census Bureau uses them in its age search operation.¹⁵⁹

Archiving of Census 2000 Data Products and Detail Files

When the Census 2000 Comprehensive Records Schedule was finalized, Census Bureau executives assumed that all official Census 2000 data products would be based on the adjusted data. The language in the schedule reflected this assumption. Descriptions of the principal data products that were to be transferred to NARA reference the incorporation of statistically adjusted data, as do the descriptions of the underlying detail files to be transferred.¹⁶⁰

Thus, because the Census Bureau expected that the 100 percent detail file incorporating a statistical adjustment would be the detail file for producing the official 100 percent data products, the agency scheduled it for transfer to NARA as a permanently valuable record; similarly, given that the Census Bureau expected to release the adjusted block-level data file as the official redistricting data, this file also had been scheduled as a permanent record.¹⁶¹

However, as explained in the “Prepublication Data Files” section, the file containing the Census 2000 adjusted data, summarized to the block-level, became part of the public domain, although not as an official data product as had been anticipated. Nonetheless, it was transferred to NARA for permanent retention as scheduled (appropriately caveated). Similarly, although the 100 percent detail file of microdata records used to tabulate the summary data incorporating a statistical

¹⁵⁷ The Census 2000 Comprehensive Records Schedule was drafted (and approved) with this expectation in mind. See “Census 2000 Comprehensive Records Schedule,” SF 115—Request for Records Disposition Authority, Job Number N1-29-00-2, approved June 14, 2000.

¹⁵⁸ 44 U.S.C. § 2108 (2006).

¹⁵⁹ Through the Census Bureau’s age search operation, under the authority of Title 13, U.S. Code, Section 8(a), an individual may request a transcript of his or her own census record for those censuses that have not yet been released to the public by NARA. This information is often used to prove age, residency, and/or identity. Additionally, a transcript of the record of a deceased person may be made available, but only to that person’s heirs, legal beneficiaries, or authorized representatives upon proof of death.

¹⁶⁰ Consistent with past records schedules for the decennial censuses, the detail files from Census 2000 were designated as permanent records.

¹⁶¹ “Census 2000 Comprehensive Records Schedule,” approved June 14, 2000.

adjustment was not a production detail file for Census 2000, it also was transferred as scheduled (and also was appropriately caveated).¹⁶²

With regard to the sample data, the sample detail file data were weighted to the population totals in the 100 percent detail file,¹⁶³ not the 100 percent detail file incorporating a statistical adjustment. Thus, the sample estimated detail file¹⁶⁴—originally scheduled for transfer to NARA—was not created and the sample edited detail file (SEDF) was transferred in its place.

Archiving of Individual Census Records From Census 2000

Background. The National Archives maintains official decennial census records dating from 1790 to the present. A 1952 agreement between NARA and the Census Bureau (later incorporated into 44 U.S.C. § 2108) provides for public access to individual census returns and other personal information 72 years after the census is conducted.

Census records are among the most widely used records in the National Archives for family, social, neighborhood, and local historical research. The personal information contained in census records makes them particularly valuable as a permanent historical record.

Discussions regarding Census 2000 records early in the decade. In the midst of the planning for Census 2000, the Census Bureau contacted NARA to discuss the potential impact of its plans on decennial census records management. Specifically, Census Bureau staff met with a NARA working group to discuss:

- Changes in census-taking contemplated for 2000.
- The impact of these changes on the kinds of records used and produced.
- The consequent effect on the use of these records by future researchers.

For example, in the four censuses prior to Census 2000, producing microform¹⁶⁵ images of the questionnaires was a direct by-product of the data capture technology—FOSDIC (film optical sensing device for input to computer). The microfilmed questionnaires were transferred to NARA as the archival record of individuals' responses. The data capture process for Census 2000 would be a dramatic change from this earlier technology.

As a follow-up to these early discussions, NARA produced a report for the Census Bureau that discussed the impact of changing the technologies for data collection and processing on the future use of Census 2000 records for historical research.¹⁶⁶ The report discussed, in some detail, categories of files and their characteristics that would be “essential” to meet the needs of genealogists, social historians, and other researchers who would eventually use them. The file categories corresponded roughly with what had been provided in the past to meet the requirements for access to individual records and other “permanently valuable” decennial census files.

By this time, the Census Bureau was considering digital imaging technology for Census 2000 data capture.¹⁶⁷ The NARA report recognized that the data collection and processing methods and technologies under consideration for Census 2000 would affect how the records would be stored

¹⁶² Note that this file contains nonaggregated person records (but without personal identifiers) and was deemed confidential under Title 13. Thus, NARA cannot make this file publicly available for 72 years. A caveat included along with the file indicated that it was not a production 100 percent detail file for Census 2000 and noted that the statistical adjustment methodology was rejected.

¹⁶³ The Census 2000 Comprehensive Records Schedule refers to this file as the “detail file” (DF) and the “100 percent detail file” incorporating a statistical adjustment as the 100 percent estimated detail file (HEDF).

¹⁶⁴ This is the term used in the Census 2000 Comprehensive Records Schedule to refer to the sample detail file in which the sample data are weighted to the (statistically adjusted) population totals in the 100 percent detail file incorporating a statistical adjustment.

¹⁶⁵ “Microform” is a generic term encompassing both microfilm and microfiche.

¹⁶⁶ National Archives and Records Administration, “Preserving Census 2000 Records,” Report of the Census 2000 Working Group, March 1, 1995.

¹⁶⁷ Later that year, in the 1995 Census Test, the Census Bureau tested the feasibility of digital imaging data capture in a production environment. The test demonstrated that commercially available hardware and software could be integrated into a production system capable of handling the data capture requirements of the decennial census.

and later accessed: “. . . [T]he Census Bureau’s proposed plans for the census count might affect eventual research use of the records by the publicIf the proposals under consideration are adopted, the Census Bureau will no longer create microform records of census questionnaires.”¹⁶⁸ The report advised that “. . . [the] Census [Bureau] should schedule electronic records for Census 2000 that have replaced the microform records created for earlier censuses.”¹⁶⁹

Award of data capture contract for Census 2000. In 1997, the Census Bureau awarded the contract for the Data Capture System 2000 (DCS 2000).¹⁷⁰ Census Bureau staff discussed the possibilities of mandating production of microform images of the completed questionnaires as a system requirement during the development of the statement of work (SOW) for DCS 2000. The proposal was rejected, with the understanding that an electronic file (in American Standard Code for Information Interchange [ASCII] format) containing respondent data in computer-readable format would satisfy the archival requirement of providing future access to individual census records. This assumption was based on the Census Bureau’s interpretation of the requirements set out in the March 1, 1995, NARA report. Thus, the SOW for DCS 2000 included no requirements to produce archival images of the completed questionnaires.¹⁷¹

Agency work to finalize Census 2000 archival requirements. Following the 1998 Dress Rehearsal, staff at the Census Bureau sought to finalize its requirements for archiving individual response data and other permanently valuable records from Census 2000. While this work was underway, the Office of Inspector General (OIG) of the U.S. Department of Commerce issued a draft inspection report—dated July 19, 1999—regarding Census 2000 archiving issues that remained unresolved. The report noted that “Census Bureau officials have acknowledged that they have been slow to address archiving.” Specifically, the OIG found that “. . . the bureau has not yet finalized its plans and procedures for questionnaire retention and disposal and cannot do so until a method has been identified for archiving the data that is acceptable to the National Archives and Records Administration (NARA). . . . The bureau needs to resolve the archiving issue as soon as possible. . . .”¹⁷²

On August 18 of that year, the Census Bureau wrote to the chairman of the Census 2000 Working Group of NARA and proposed, as a way to meet the requirement to provide NARA with individual records from the 2000 decennial census, submitting ASCII computer files containing the response data for every household and group quarters resident counted in Census 2000.¹⁷³ The Census Bureau noted that each ASCII record would contain all response data, including name and other written entries provided by the respondent, and all address/geographic information contained in the decennial master address file for that housing unit or person living in a group quarters facility.

NARA responded to this proposal on September 8, noting “[w]e concur with the Census Bureau’s proposal to transfer to NARA a single ASCII data file of the individual Census 2000 records. . . . We have also determined that the information content of the ASCII data file described in the plan meets the ‘essential’ characteristics and functions of historically valuable census records which we

¹⁶⁸ “Preserving Census 2000 Records,” March 1, 1995, p. 1.

¹⁶⁹ *Ibid.*, p. 2.

¹⁷⁰ The Census 2000 questionnaires would be fed into a scanner that would produce a digital image of the questionnaire. The system would then convert the contents of the image files to computer-readable format (specifically, ASCII format) through optical mark recognition (OMR) and optical character recognition (OCR) processes. OMR is used for all check-box data items and OCR “interprets” handwritten responses to write-in data items. See Chapter 6, “Data Processing” for detailed information about Census 2000 data capture and processing operations, including DCS 2000.

¹⁷¹ The digital image files created in the DCS 2000 process were “intermediate” files, not designed for archival purposes. That is, once the contents of images were converted to computer-readable format through the OCR and OMR processes or in the key-from-image operation, the image files primarily functioned as a short-term backup and recovery system in the data capture centers until confirmation of receipt of the resultant ASCII data files at headquarters for processing.

¹⁷² The referenced language appears verbatim in the final reports as well, so that report is cited here. U.S. Department of Commerce, Office of Inspector General, “Method for Archiving 2000 Decennial Data and Procedures for Disposing of Questionnaires Should Be Finalized,” Inspection Report No. OSE-10758, September 1999, pp. 5 and 2.

¹⁷³ Preston Jay Waite, Assistant Director for Decennial Census, U.S. Census Bureau, to Larry Baume, Chairman, Census 2000 Working Group, National Archives and Records Administration, August 18, 1999 (enclosure to letter).

identified in our March 1, 1995 report titled “Preserving Census 2000 Records.”¹⁷⁴ As the National Archives Assembly later noted, the Census Bureau (certainly after having received NARA’s concurrence on its proposed plan for the transfer of the ASCII data file) was “. . . under the impression that they were meeting the needs of NARA and future generations of researchers by budgeting for, preparing, and eventually arranging for transfer an electronic file . . . [later referred to] as the Individual Census Record File (ICRF). . . .”¹⁷⁵

The Census Bureau responded to the OIG draft inspection report in early September 1999 by stating that it had transmitted to NARA its proposal for the archiving of individual response data from Census 2000 and anticipated obtaining that agency’s formal approval.¹⁷⁶

In the fall of 1999, Rep. Henry A. Waxman (D-CA), the ranking minority member of the House Committee on Government Reform, which had oversight responsibility for the Census Bureau, expressed concerns about how the individual respondent data obtained in Census 2000 would be maintained as a permanent record. First, in November, he wrote to the General Accounting Office, raising questions about “. . . the risk to the public if no image of the 2000 census forms is preserved.”¹⁷⁷ In December, Rep. Waxman reiterated his concerns in a letter to Census Bureau Director Kenneth Prewitt.¹⁷⁸ Noting that the agency was in the process of submitting schedules for Census 2000 records to NARA for approval, he urged Director Prewitt to consider proposing to NARA that the digital image files of the scanned questionnaires—as well as the ASCII data file—be scheduled as a permanent record. Rep. Waxman noted that failure to schedule the image files as a permanent record would mark the first time that images or facsimiles of the completed census questionnaires were not preserved.

Scheduling and appraisal of the digital image files from DCS 2000. The Census Bureau proposed in one of several schedules submitted to NARA in December 1999, that the digital image files of the scanned questionnaires be scheduled as temporary records. That is, the Census Bureau anticipated having a programmatic or evaluative need to save these files for a period of years, but believed that they lacked enduring historical value to warrant their transfer to NARA for permanent retention. The Census Bureau considered the image files from DCS 2000 (that is, images of the questionnaires) to be intermediate processing files from which, after a number of data capture and processing procedures, the “final” unduplicated, unedited set of individual response data would be produced in electronic format. Furthermore, the agency noted that not all questionnaires would be scanned; for example some respondents’ answers would be captured initially in electronic format (Telephone Questionnaire Assistance [TQA] interviews and Internet Data Collection [IDC] returns, for example), so there would be no images of completed questionnaires for these cases.¹⁷⁹ Thus, the Census Bureau contended that the digital image files of questionnaires had little value as a complete archival record, largely because the files would not constitute a complete set of census returns. The ASCII file (the ICRF), on the other hand, would be a complete record that would include census returns from all response modes and would incorporate

¹⁷⁴ Marie B. Allen, Director, Life Cycle Management Division, National Archives and Records Administration, to Preston Jay Waite, Assistant Director for Decennial Census, U.S. Census Bureau, September 8, 1999.

¹⁷⁵ The National Archives Assembly, “Resolution Regarding the Disposition of the Census 2000 Image Files,” July 20, 2000, p. 2. The National Archives Assembly was an organization of present and former NARA employees that provided a forum for employee communication on NARA policies and programs to, among other things, convey its members’ views to the archivist of the United States (the head of NARA).

¹⁷⁶ Memorandum on Draft Inspection Report No. OSE-10758 from Kenneth Prewitt, Director, U.S. Census Bureau, to Judith J. Gordon, Assistant Inspector General for Systems Evaluation, Office of Inspector General, U.S. Department of Commerce, September 10, 1999, p. 1.

¹⁷⁷ Rep. Henry A. Waxman, Ranking Minority Member, Committee on Government Reform, U.S. House of Representatives, to the Honorable David M. Walker, Comptroller General, U.S. General Accounting Office, November 4, 1999, p. 2. By legislation enacted into law in July 2004, the name of the entity was changed to Government Accountability Office.

¹⁷⁸ Rep. Henry A. Waxman, Ranking Minority Member, Committee on Government Reform, U.S. House of Representatives, to Kenneth Prewitt, Director, U.S. Census Bureau, December 1, 1999.

¹⁷⁹ Because of the large number of different form types used in group quarters enumeration operations, data from these questionnaires were keyed into computers. See Chapter 5, “Data Collection”, for descriptions of the TQA and IDC programs.

important processing steps—including the elimination of duplicate records and combining of appropriate portions of multiple returns from the same household. The ICRF would also be used by the Census Bureau in its age search operation (discussed above). The NARA later approved the scheduling of the ICRF as a permanent record.¹⁸⁰

When NARA conducted its original appraisal of the digital image files, it agreed with the Census Bureau that the files should be scheduled as temporary records. In addition to the points raised above, NARA also cited the following reasons for appraising the images as temporary records:

- The interspersed blank pages (having no value) in the image files (estimated to constitute roughly two-thirds of all the images).¹⁸¹
- The lack of an index or the ability to search for/retrieve particular images based on respondent identifiers (name, address, etc.).¹⁸²

Comments regarding proposed schedule for the image files. On March 6, 2000, NARA announced that the schedule and appraisal pertaining to the image files were available for comment, and NARA directly solicited comments from a number of genealogical, social science, and public policy organizations. Most of the comments NARA received—including those from Rep. Waxman—urged the permanent retention of the image files. The most common reasons given were:

- Images of the completed questionnaires were available for all previous censuses.
- The images would contain “marginalia” (handwritten comments made in the margins of the questionnaire pages that may or may not be relevant to any particular question) that generally do not get recorded in the data capture process.
- The images would permit future analysis of the handwriting in the case of write-in responses.¹⁸³

Initial appraisal reversed; digital images scheduled as permanent records. Even before the comment period closed, NARA conducted another appraisal (dated May 18, 2000) of the images, this time recommending that they be retained permanently. In a letter dated May 17, Assistant Archivist Michael Kurtz wrote to Rep. Waxman, informing the representative that he planned to recommend to the archivist (the head of NARA) that the image files be permanently retained.¹⁸⁴ On June 7, 2000, Archivist John Carlin signed the records disposition schedule authorizing permanent retention of the digital images.¹⁸⁵

The May 18 appraisal noted that the recommendation that the images be scheduled as permanent records was based on public comments, internal NARA discussions, and discussions with staff from the Census Bureau and General Accounting Office.¹⁸⁶ For example, the appraisal report indicated that the latter discussions enabled NARA to confirm that it was “. . . technically feasible to develop an [sic] computer system that is capable of linking the scanned images to a unique Housing Unit Identification Number, and further by person, address, and other geographic coding.”¹⁸⁷

¹⁸⁰ “Census 2000 Records System Disposition (Partial Schedule),” SF 115—Request for Records Disposition Authority, Job Number N1-29-00-001 (Item No. 3), approved March 6, 2000.

¹⁸¹ Because of the way in which the questionnaire forms/booklets were constructed, the DCS 2000 contractor scanned the entire form/booklet, regardless of the number of persons for whom there were data. The short- and long-form questionnaires had space to provide data for up to six residents.

¹⁸² “Resolution Regarding the Disposition of the Census 2000 Image Files,” July 20, 2000, p. 3.

¹⁸³ *Ibid.*

¹⁸⁴ Michael J. Kurtz, Assistant Archivist, National Archives and Records Administration, to Rep. Henry A. Waxman, Ranking Minority Member, Committee on Government Reform, U.S. House of Representatives, May 17, 2000.

¹⁸⁵ SF 115—Request for Records Disposition Authority, Job Number N1-029-00-004, approved June 7, 2000.

¹⁸⁶ Larry Baume, Life Cycle Management Division, National Archives and Records Administration, Appraisal Report, “Job No. N1-29-00-3, Digital Image Files of Census 2000 Questionnaires and Forms,” May 18, 2000, p. 1.

¹⁸⁷ *Ibid.*

National Archives Assembly urges archivist to reconsider his decision. On July 20, 2000, the Executive Board of the National Archives Assembly issued a resolution urging the archivist to revisit his decision scheduling the image files as a permanent record.¹⁸⁸ Some of the issues the assembly raised had already been discussed, but the organization made a number of additional points that argued against the permanent retention of the images. Predominant among these was the sheer volume of images to be transferred—approximately 700 million.¹⁸⁹ As noted earlier, the Census Bureau estimated that roughly two-thirds of these images would be of blank questionnaire pages. NARA acknowledged that, because of the way in which the questionnaire forms/booklets were constructed and thus scanned, removing the images that contained no data before transferring the files was infeasible.¹⁹⁰

The transfer of the 700 million images—which, in electronic format, would require 160 terabytes (160 x 10¹² bytes) of disk space¹⁹¹—would alone increase the total size of NARA’s holdings by 17.5 percent.¹⁹² Depending on the transfer medium, NARA required both a master and a backup copy of the records. If this requirement were to be met, NARA estimated the cost of maintaining those records at between \$14 million and 28 million a year.¹⁹³ The National Archives Assembly noted that if microfilm were determined to be the preferred transfer and/or preservation medium, the cost to convert the images to microfilm could easily approach \$70 million (or 10 cents per image) to produce one complete archival record, and existing regulations governing microfilm records required the transfer of both the original film and a backup copy.¹⁹⁴ Thus, the assembly emphasized its concerns about the “. . . inability to determine the exact cost of archival retention because no one has ever attempted to preserve and maintain a collection of this magnitude. . . .”¹⁹⁵

Finally, the assembly noted that “. . . the normal procedures involving stakeholder review and comment were not followed in the processing of . . . [the revised appraisal and schedule for the image files].”¹⁹⁶ The assembly was referring to NARA’s normal appraisal procedures that required the agency to circulate new disposition schedules and appraisal reports to various stakeholder units as a means of ensuring adequate and proper documentation regarding appraisal decisions. In this case, the assembly noted the appraisal package was not circulated to NARA’s custodial units for review and comment.¹⁹⁷ The assembly concluded:

The [appraisal] dossier for N1-029-00-004 does not contain either a formal or informal technical analysis of the Census 2000 images. The official record also does not address budgetary implications, interspersions of valueless material, or a substantive analysis and verification of concerns expressed in the public comments. Because these issues are not addressed in the appraisal dossier and, therefore were not brought to the Archivist’s attention, he could not consider them.¹⁹⁸

Archivist responds to assembly; images to be converted to microform. On October 23, 2000, the archivist sent a letter to the president of the National Archives Assembly in response to its resolution of July 20, 2000. The letter noted that extensive discussions between NARA and the Census Bureau led to the agreement that the Census Bureau would convert the digital images of

¹⁸⁸ “Resolution Regarding the Disposition of the Census 2000 Image Files,” July 20, 2000. The National Archives Assembly is briefly described in footnote 175.

¹⁸⁹ *Ibid.*, p. 1.

¹⁹⁰ John W. Carlin, Archivist of the United States, to Lisa Haralampus, President, National Archives Assembly, October 23, 2000, p. 2.

¹⁹¹ “Resolution Regarding the Disposition of the Census 2000 Image Files,” July 20, 2000, p. 4.

¹⁹² *Ibid.*

¹⁹³ *Ibid.*, p. 5.

¹⁹⁴ *Ibid.*, pp. 4–5.

¹⁹⁵ *Ibid.*, p. 1.

¹⁹⁶ *Ibid.*

¹⁹⁷ *Ibid.*, p. 6.

¹⁹⁸ *Ibid.*

the questionnaires—prior to their transfer to NARA—to microform through a process called computer output to microform (COM).¹⁹⁹ NARA described the many advantages of microform as an interim or long-term storage format, stating:

“NARA maintains all individual census response information from 1790 to the present in microfilm format, and we have a long and successful record of preserving microfilm under strict environmental standards, and making it available to the public.”²⁰⁰

The Census Bureau agreed to develop a basic indexing system that would allow future researchers to use the individual census record file (ICRF) to locate the images of the *primary* questionnaire for a household whose information appears on the microfilm through the use of the master address file (MAF) (or census) ID number (a unique number for each housing unit).²⁰¹ The archivist’s letter noted the existence of “blowback” technology, which can convert the microfilm images back to digital images if it is decided that a digital medium is the appropriate format in which to make the images of the completed questionnaires available to the public in 2072.²⁰²

Census Bureau enlists contractors to complete archiving work. As mentioned earlier, both the digital image files and microform copies of the questionnaire images would be transferred to NARA for permanent retention. Because the imaging component of DCS 2000 was not designed for archival purposes, extensive work was required to prepare the image files for the COM process and to develop an indexing system based on the MAF ID associated with each image. The DCS 2000 contract was modified to include this image retrieval system development work at a cost of \$17 million.²⁰³

The Census Bureau, in cooperation with NISH,²⁰⁴ awarded a \$27 million contract to Business Technology Career Opportunities of Wichita, KS and its partner, Service Source of Alexandria, VA, to conduct the COM work.²⁰⁵ As an image was copied to microfilm, the microfilm roll and frame number were linked to the MAF ID of the housing unit to which the image pertained.

After completion of the COM conversion, the MAF IDs were used to link the film roll and frame number for a particular image to the relevant housing unit record in the ICRF. Once all the linkages were established, the Census Bureau entered the applicable roll and frame number information into a field in the associated ICRF record. Thus, future researchers working with the ICRF will be able to locate the primary questionnaire images pertaining to a particular household (assuming images were produced for that household’s census return).

¹⁹⁹ NARA earlier documented the agreement in an October 5, 2000, letter from Archivist Carlin to Rep. Waxman, Ranking Minority Member, Committee on Government Reform, U.S. House of Representatives.

²⁰⁰ John W. Carlin, Archivist of the United States, to Lisa Haralampus, President, National Archives Assembly, October 23, 2000, p. 1. Thus, microfilm copies of the images (in addition to the digital image files) were scheduled as a permanent record. See SF 115—Request for Records Disposition Authority, Job Number N1-029-03-002, approved July 16, 2003.

²⁰¹ John H. Thompson, Associate Director for Decennial Census, U.S. Census Bureau, to Dr. Michael J. Kurtz, Assistant Archivist, National Archives and Records Administration, August 10, 2000, p. 2.

²⁰² Letter from Carlin to Haralampus, October 23, 2000, pp. 1–2.

²⁰³ See footnote 49 in Chapter 6, “Data Capture and Processing” for additional information regarding this contract modification.

²⁰⁴ Formerly called the National Industries for the Severely Handicapped, the organization now goes by its acronym.

²⁰⁵ Additional information regarding this contract is contained in the “Data Archiving” section of Chapter 6, “Data Capture and Processing.”

Chapter 10.

Testing, Experimentation, Evaluation, and Coverage Measurement Programs

INTRODUCTION	447
TESTING AND EXPERIMENTATION PROGRAM	448
Alternative Questionnaire Experiment (AQE2000)	448
Skip instruction	448
Residence instructions	449
Race and Hispanic origin	449
Administrative Records Experiment in 2000 (AREX 2000)	450
Social Security Number, Privacy Attitudes, and Notification (SPAN) Experiment	451
Response Mode and Incentive Experiment (RMIE)	454
Census 2000 Supplementary Survey (C2SS)	455
Ethnographic Studies	455
Privacy Schemas and Data Collection: An Ethnographic Account	456
Generation X Speaks Out on Civic Engagement and the Decennial Census: An Ethnographic Approach	456
Complex Households and Relationships in the Decennial Census and in Ethnographic Studies of Six Race/Ethnic Groups	457
EVALUATION PROGRAM	458
Category A: Response Rates and Behavior Analysis	458
Category B: Content and Data Quality	459
Category C: Data Products	459
Category D: Partnership and Marketing	460
Category E: Special Places and Group Quarters	460
Category F: Address List Development	461
Address listing	461
Local Update of Census Addresses 98 (LUCA 98)	462
Block canvassing	463
Local Update of Census Addresses 99 (LUCA 99)	463
Update/leave (U/L)	464
Urban update/leave (UU/L)	464
Update/enumerate (U/E)	465
List/enumerate (L/E)	466
An assessment of addresses on the MAF "missing" in the census or geocoded to the wrong collection block	466
Evaluation of the block splitting operation for tabulation purposes	468
Category G: Field Recruiting and Management	469
Category H: Field Operations	469
Category I: Coverage Improvement	470
Category J: Ethnographic Studies	471
Comparative ethnographic research on mobile populations	471
Ethnographic social network tracing of highly mobile people	472
The enumeration of colonias in Census 2000: perspectives of ethnographers and census enumerators	473
Category K: Data Capture	474
Category L: Processing Systems	474
Category M: Quality Assurance Evaluations	476
Category N: Accuracy and Coverage Evaluation (A.C.E.)	
Survey Operations	477
Category O: Coverage Evaluations of the Census and of the A.C.E. Survey	477
Examination of the consistency of census data with demographic benchmarks at the subnational level	477
Category P: A.C.E. Statistical Survey Design and Estimation	479
Category Q: Organization, Budget, and Management Information System	479
Category R: Automation of Census Processes	480

CONTENTS

COVERAGE MEASUREMENT PROGRAMS	481
Accuracy and Coverage Evaluation (A.C.E.)	481
Introduction	481
Overview of A.C.E. design/methodology	482
First-phase sampling	482
Second-phase sampling	483
Targeted extended search (TES) sampling	484
Subsampling within large block clusters	484
A.C.E. person operations	485
Housing unit duplication	486
A.C.E. estimation	486
The dual system estimate	487
Synthetic estimation for small areas	487
Measures of accuracy in the A.C.E.	488
Housing unit dual system estimates	488
Initial results and evaluations of the A.C.E.—March 2001 redistricting data adjustment decision	488
Conduct of Key Operations	489
Comparison With Demographic Analysis	489
Total Error Model and Loss Function Analysis	489
Synthetic Error	490
Balancing Error	490
Late Adds and Whole Person Imputations	491
Misclassification Error	491
Further evaluation of the A.C.E. estimates and second decision on adjustment	491
Production of revised demographic analysis estimates	492
Balancing error revisited	493
Missing data	493
High level of error in the A.C.E. measurement of net coverage in Census 2000	494
Release of “revised early approximations” of Census 2000 net undercount	495
Census Bureau embarks on A.C.E. Revision II research	495
Measurement Correction Study	496
Further Study of Person Duplication (FSPD)	497
Estimation methodology	497
Adjustment for correlation bias	497
Summary of the methodology; changes to the March 2001 A.C.E. estimates	498
Summary of A.C.E. Revision II results	499
Decision on intercensal population estimates	500
Implications for the 2010 Census	501
Demographic Analysis (DA)	501
Introduction	501
Methodology	501
Limitations of the DA methodology	502
Use of DA to evaluate the census master address file	502
The role of DA in assessing the A.C.E. estimates for the adjustment decision	503
DA used to assess the housing unit counts from Census 2000	503
ESCAP recommendation and decision on adjustment	504
Continued evaluation of the adjusted data and plans for second decision	505
Plans for reexamining the DA estimates	506
Recommendation against adjustment based on high level of A.C.E. error	506
Revisions to the DA estimates: results and findings	507
Adjustment decision and release of limited revised A.C.E. estimates	509
A.C.E. Revision II work conducted; revised estimates produced	509
A.C.E. Revision II estimates incorporate adjustment for correlation bias	510
Census Bureau decides against use of A.C.E. Revision II estimates	512
Implications for the 2010 Census	512

Chapter 10: Testing, Experimentation, Evaluation, and Coverage Measurement Programs

INTRODUCTION

Throughout the early twentieth century, the Census Bureau explored various means to evaluate its activities. During the period between World War I and World War II, the agency researched the use of intercensal population estimates, sampling techniques, and methods for evaluating the completeness of the decennial census. After 1940, the agency began a post-censal program to evaluate some of the questions on the census form. With the 1950 census, the Census Bureau established a formal program to complete evaluations of census operations and conduct research through experiments embedded within the census. The 1950 Research, Evaluation, and Experimental (REX) program assessed the accuracy of the census by measuring error and identifying its sources. REX also evaluated coverage through a post-enumeration survey. The 1950 program initiated an era during which the Census Bureau conducted systematic reviews of its current activities and research to improve the design of the next decennial census. The agency continued to expand the REX program to address various concerns over coverage measurement, coverage improvement, content, and quality control.¹

With Census 2000, the agency sought to further expand the REX program to accomplish five primary objectives: assess data content and quality; evaluate census procedures and operations; conduct research on new methodologies and demographic changes; measure accuracy and coverage in the census; and help guide planning for the 2010 Census. To that end, the Census Bureau established the Testing, Experimentation, and Evaluation (TXE) program for Census 2000. TXE consisted of a testing and experimentation program and an evaluation program.² The Census Bureau's Planning, Research, and Evaluation Division (PRED) coordinated the efforts of subject-matter experts (both agency personnel and contractors) involved in the TXE program. Specifically, it established selection criteria for experimentation and evaluation proposals, developed quality assurance guidelines for ensuing reports, and coordinated the production of synthesis reports of each area of evaluation and experiment.

This chapter also includes a discussion of the two principal methods the Census Bureau uses to evaluate coverage in the census. The agency compares the census counts to two sets of estimates of net undercount: (1) estimates produced through dual system estimation (DSE) in conjunction with a post-enumeration survey or coverage measurement survey and (2) estimates produced by a methodology known as demographic analysis (DA). In Census 2000, the coverage measurement survey was called the Accuracy and Coverage Evaluation (A.C.E.). The results from the A.C.E. and DA programs and discussions of how they were used to evaluate net coverage in Census 2000 can be found in the "Coverage Measurement Programs" section of the chapter.

The testing and research program conducted during the course of the decade to develop new approaches and techniques for possible implementation in Census 2000 is discussed in Chapter 2, "Planning the Census."

¹ For more information on past REX programs, see U.S. Census Bureau, *1990 Census of Population and Housing History, Part D*, 1990 CPH-R-2D (Washington, DC: U.S. Government Printing Office, 1996), Chapter 11, "Census Research, Evaluation, and Experimental (REX) Program."

² The discussion of the Census 2000 TXE program in this chapter describes the experiments and evaluations that were carried out under the program and summarizes the findings and recommendations that emanated from their results. How the findings and recommendations are used (or not) to inform and guide the 2010 Census planning process will be the subject of the early planning and development chapter of the *History: 2010 Census*.

TESTING AND EXPERIMENTATION PROGRAM

In 1997, the Census Bureau formed a Research and Experimentation Program Steering Committee to develop the Census 2000 program of testing and experimentation that would provide information for use in planning the 2010 Census. The committee requested and reviewed proposals from all organizational units of the Census Bureau. From more than 37 proposals, the committee selected four experiments based on the following four mandatory and three recommended criteria.

Mandatory criteria:

- The experiment must require testing in a decennial census environment.
- The experiment must provide measurable results.
- The experiment must not compromise the success of the census.
- The experiment should provide information that will assist in planning major components of future decennial censuses.

Recommended criteria:

- The experiment should be designed to minimize adverse effects of the experimental treatment on respondents and enumerators.
- The experiment should provide significant potential benefits in terms of cost reduction, improved coverage, improved data quality, improved operational work flow, and/or other measures of benefit.
- The experiment should add no burden or minimal burden to respondents as part of Census 2000.³

Those proposals selected included the Census 2000 Alternative Questionnaire Experiment; Administrative Records Experiment in Census 2000; Social Security Number, Privacy Attitudes, and Notification Experiment; and the Response Mode and Incentive Experiment.⁴ The committee also added the Census 2000 Supplementary Survey and ethnographic studies to the TXE program. The experiments were embedded in and thus conducted as part of Census 2000 to ensure a census “environment” as the basis for making inferences from the results.

Alternative Questionnaire Experiment (AQE2000)

Since 1980, the Census Bureau has conducted alternative questionnaire experiments (AQEs) with each decennial census to test the effects of variations in questionnaire design on response rates and data quality. The objective of such experiments is to develop a user-friendly mailout questionnaire that can be completed accurately by respondents. In 1980, the agency tested two FOSDIC (Film Optical Sensing Device for Input to Computers) matrix-style forms and one non-FOSDIC form designed to be visually appealing and easily understood by respondents. The 1990 AQE compared five long-form questionnaires with considerable changes in wording and format from previous designs. For Census 2000, the AQE included three separate experiments—skip instruction, residence instructions, and race and Hispanic origin.

Skip instruction. The skip instruction experiment examined how changes in branching instructions and the language types (verbal, symbolic, and graphic) used to create them would affect respondent performance on the census long form. This experiment used two designs. The first combined visual features and instructions to help prevent respondents from making errors before they occurred and the second was designed to help respondents detect errors after they occurred. Other design improvements were used, including visual cues such as large bold type and arrows to prompt respondents to detect and correct their mistakes.

³ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, November 17, 2004, pp. 2–3.

⁴ The use of the Employee Reliability Inventory file for the nonresponse follow-up enumerators experiment was originally planned as a component of the TXE program, but was later removed.

This experiment considered two types of errors—errors of commission and errors of omission. Errors of commission occur when a respondent incorrectly answers questions he or she should have skipped. Such errors often increase response burden and frustration. Errors of omission occur when a respondent skips questions he or she should have answered, resulting in missing data. During the skip instruction experiment, all experimental treatments significantly reduced errors of commission. Errors of omission decreased for the detection treatment (that is, the experimental design intended to help respondents detect errors after they occurred), but significantly increased for every other treatment. Because it reduced both types of errors, the detection treatment was recommended for use in the future design of mail questionnaires.⁵

Residence instructions. The use of questionnaires as the principal mode of data collection can often lead to difficulties when the design and data demands of a survey require rules of inclusion that are too complex or counterintuitive for respondents. The residence instructions experiment focused on how the presentation of residence instructions—that is, the instructions to respondents for determining who should be counted as a resident of the household—on the census short form might influence within-household coverage. Changes in presentation included altering the format, placement, and wording of instructions in order to make them more understandable and more likely to be read.

Working with its contractor, Westat, the Census Bureau conducted a series of cognitive interviews to determine how the presentation of the household-roster instructions might be improved. Once an experimental format was selected, it was used on a sample of mailout/mailback forms that was sent out according to the Census 2000 schedule. The Census Bureau then measured coverage through a telephone reinterview operation. The changes in format, presentation, and wording of the residence instructions resulted in a significantly higher response to the household count question.⁶ The experimental group also produced significantly fewer omissions among Hispanics in the low-coverage stratum.⁷

Race and Hispanic origin. In 1997, the U.S. Office of Management and Budget mandated changes in methods for collecting race data in government surveys and censuses. Such changes included allowing respondents to report one or more races and reversing the sequence of the race and Hispanic origin items. The Census 2000 questionnaire design introduced other changes in format, categories, and wording. For this experiment, the Census Bureau mailed 1990-style short forms to an experimental sample of 10,500 households and a control panel of about 25,000 received Census 2000 questionnaires. The 1990-style form preserved the 1990 question wording, categories, order, and format but incorporated elements of the Census 2000 design. The race and Hispanic origin experiment examined the effects of the differences for these two questions between the Census 2000 and 1990-style forms on race and Hispanic reporting by comparing the responses for the corresponding items.

Overall, the questionnaire revisions substantially improved the completeness of race and Hispanic origin reporting in mailed short-form questionnaires. In addition, Hispanics were less likely to report their race as Some Other Race, and more likely to report as White, in the 2000-style questionnaires. Although there were no apparent questionnaire effects on the fraction of people reported as Hispanic, there were effects on the reporting of detailed Hispanic origin groups. The 1990-style questionnaire obtained more detailed reports of Hispanic origin than the 2000-style questionnaire, probably due to the effects of question wording differences as well as examples. Other findings include, for example, that there were more reports of Native Hawaiian and Other

⁵ Cleo Redline, Don Dillman, Aref Dajani, and Mary Ann Scaggs, *Census 2000 Testing, Experimentation, and Evaluation Program: The Effects of Altering the Design of Branching Instructions on Navigational Performance in Census 2000, Final Report*, September 30, 2002, pp. 1-3 and 7-11; Elizabeth Ann Martin, Eleanor Gerber, and Cleo Redline, *Census 2000 Alternative Questionnaire Experiment, Census 2000 Testing, Experimentation, and Evaluation Program Synthesis Report No. 17, TR-17, March 2004*.

⁶ This question serves as an indicator of data that might be missing on a questionnaire and a flag of large households requiring follow-up because the questionnaire only had space to provide data for up to six residents.

⁷ Low-coverage areas were composed of sections of the United States with high concentrations of non-White residents and renters, two groups that were associated with low response rates. The rest of the nation comprised high-coverage areas.

Pacific Islander, and fewer reports of Some Other Race with the Census 2000 questionnaire design as compared to the 1990-style form. The experiment demonstrated that some questionnaire design changes made in Census 2000 resulted in substantial improvements in data quality, but that other changes had unintended consequences.⁸

Administrative Records Experiment in 2000 (AREX 2000)

AREX 2000 was the Census Bureau's first attempt to use administrative records as the foundation for a short-form decennial census. It examined the feasibility of conducting an administrative records census (ARC) as well as the use of administrative records as an ancillary method of data collection for the decennial census. AREX 2000 compared two methods of conducting an ARC. One relied solely on administrative records—such as birth and death records—and the other combined traditional enumeration methods with the use of administrative records. AREX 2000 also tested the potential uses of administrative records data for substitution processes and for other methods of defining and enumerating the nonresponse follow-up (NRFU) universe.

The Census Bureau conducted AREX 2000 in two sites selected for their variety of population and housing characteristics. This variety would help to reveal the challenges that might arise from conducting an ARC. The agency selected for the experiment, Baltimore City and Baltimore County in Maryland, and Douglas, El Paso, and Jefferson Counties in Colorado. Each site was believed to have approximately one million housing units and a population of approximately two million persons.⁹

AREX 2000 used a two-phase process to complete the enumeration. In the first, or top-down, phase the Census Bureau assembled records from a number of national administrative record systems and unduplicated individuals' records that appeared more than once within the combined systems. This was followed by computer geocoding of street addresses to the level of census block, and two attempts to obtain and code physical addresses for those that could not be geocoded by computer. Finally, the "best" demographic characteristics for each individual and "best" street address within the experimental sites were selected. The second, bottom-up, phase consisted of correcting errors in administrative records addresses through address verification (analogues to coverage improvement follow-up) and the addition of persons missed in the administrative records (analogues to nonresponse follow-up). With the top-down and bottom-up processes considered as part of one overall design, AREX 2000 can be thought of as a prototype for a conventional census with the initial mailout replaced by a top-down administrative records enumeration. There were four principal limitations on the experiment:

- The administrative records source files were limited to those used in the creation of the Statistical Administrative Records System (StARS) 1999, which relied primarily on files for tax year 1998 and other files extracted early in calendar year 1999. These files neither exhausted the national-level administrative records that might have been available for the AREX 2000 nor were they the most timely with respect to April 1, 2000, Census Day for Census 2000.
- The number of experimental sites was small. Although it would not have been reasonable or realistic to attempt to mount this first administrative records experiment in a representative sample of geographic areas large enough to make national estimates, additional sites would have provided more confidence that the results were not idiosyncratic to the sites selected.
- There was no experimental variation in key design parameters, such as the clerical operations, field operations, and the address-selection algorithm. Without some factorial or fractional factorial structure, direct estimates of operational impacts of components, individually or in combination, were not possible.

⁸ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, Appendix A: Summary Results of Individual Evaluations and Experiments, November 17, 2004, p. A104-05; Elizabeth Martin, *Census 2000 Alternative Questionnaire Experiment: Questionnaire Effects on Reporting of Race and Hispanic Origin: Results of a Replication of the 1990 Mail Short Form in Census 2000, Final Report*, December 12, 2002.

⁹ Barry V. Bye and Dean H. Judson, *Results from the Administrative Records Experiment in 2000*, Census 2000 Testing, Experimentation, and Evaluation Program Synthesis Report No. 16, TR-16, March 2004.

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- The measurement of race and Hispanic origin in administrative records at the national level is deficient. Attempts were made to improve the measurement through the use of certain statistical models, but the results were not entirely satisfactory.

The Administrative Records Research Staff (ARRS) of PRED conducted four evaluations of AREX 2000: the process evaluation, the request for physical address evaluation, the outcomes evaluation, and the household evaluation.

The process evaluation analyzed components and procedures of the top-down and bottom-up methods in order to identify errors or deficiencies. It documented the processes by which raw administrative data became final AREX 2000 counts and attempted to identify the relative contributions of each process.¹⁰ The request for physical address evaluation assessed the impact of non-city-style addresses. These addresses presented a significant hurdle to the use of an administrative records census on either a supplemental or substitution basis. A particular problem was the determination of residential addresses and their associated geographic block-level allocation for individuals whose administrative record address was a P.O. box or rural route.¹¹ The outcomes evaluation compared the top-down and bottom-up AREX counts by county, tract, and block-level counts of the total population by race, Hispanic origin, age groups, and gender, with comparable decennial census counts.¹² Finally, the household evaluation focused on household-level comparisons between administrative records and Census 2000. It assessed the potential for NRFU substitution and household imputations and for predictive capability.¹³

These evaluations noted the potential for significant cost savings through the use of administrative records substitution for NRFU households. They also observed limitations on the availability of data for the under 18 population as well as data for race and Hispanic origin using administrative records. The ARRS recommended improvements in computer matching and rematching processes, master address file development, address selection rules, and forms design. For the 2010 Census, the recommended research agenda for administrative records included the following items, among others:

- Additional evaluation of the impact of clerical and field operations in AREX 2000.
- Person unduplication in the AREX bottom-up process.
- Repeating AREX 2000 with Statistical Administrative Records System 2000 data.
- Analysis of coverage gaps in administrative records related to persons in group quarters.
- Contributions to subnational demographic analysis.

Social Security Number, Privacy Attitudes, and Notification (SPAN) Experiment

Anticipating an increased reliance on administrative records in future decennial censuses, the Census Bureau conducted the SPAN experiment as part of the Census 2000 TXE program. The SPAN experiment combined a survey component and a panel component (that is, the use of experimental groups and a control group to test different treatment effects) to assess the public's attitudes on privacy and confidentiality issues related to an administrative records census and to further examine how the notification of administrative records use and the request for a social security number would affect overall census response rates and nonresponse rates to particular questions.¹⁴

¹⁰ Michael A. Berning and Ralph H. Cook, *Census 2000 Experiment: Administrative Records Experiment in 2000 (AREX 2000) Process Evaluation, Final Report*, April 17, 2003.

¹¹ Michael A. Berning, *Census 2000 Experiment: Administrative Records Experiment in 2000 (AREX 2000) Request for Physical Address Evaluation, Final Report*, April 17, 2003.

¹² Harley K. Heimovitz, *Census 2000 Experiment: Administrative Records Experiment in 2000 (AREX 2000) Outcomes Evaluation, Final Report*, April 17, 2003.

¹³ Mark Bauder and D. H. Judson, *Census 2000 Experiment: Administrative Records Experiment in 2000 (AREX 2000) Household Level Analysis, Final Report*, April 17, 2003.

¹⁴ For more information on SPAN, see Jennifer A. Guarino, Joan M. Hill, and Henry F. Woltman, *Census 2000 Testing, Experimentation, and Evaluation Program: Analysis of the Social Security Number Notification Component of the Social Security Number, Privacy Attitudes, and Notification Experiment, Final Report*, November 13, 2001; E. Singer, J. Van Hoewyk, and R. Tourangeau (Survey Research Center, University of Michigan), and D. M.

For the survey component, the agency commissioned The Gallup Organization and the Institute of Social Research at the University of Michigan to gather information on public attitudes toward the census, data sharing by federal government agencies, and issues of confidentiality and privacy such as willingness to provide social security numbers (SSNs). Between July and October 1999 and April and July 2000, The Gallup Organization carried out two surveys, one before Census Day and one after. The pre-census survey was conducted before the launch of the Census 2000 publicity campaign, and the post-census survey occurred immediately after Census Day. These studies built upon earlier research conducted in 1995 by the University of Maryland in consultation with the Census Bureau. In 1996, Westat conducted a similar study, the Study of Privacy Attitudes Toward Administrative Records Use, to determine how public opinion on such matters might have changed in a year. Following Census 2000, the Census Bureau commissioned a small telephone survey of Puerto Rico.

The panel component consisted of two studies examining respondents' behavioral responses to SSN requests and/or public notification of administrative records use. The Social Security Number Notification study evaluated the effects on mail response rates and form completeness of the SSN request and the notification of administrative records use. The Social Security Number Validation study focused on the accuracy of SSNs provided by respondents and examined the effects of the SSN request and administrative records notification on their validation rates. Both studies used data collected during Census 2000, with ten panels using different experimental treatments.

In brief, the results of the Survey of Privacy Attitudes in 2000 indicated that:

- The public steadily increased its knowledge and awareness of the census, its uses, and laws related to confidentiality practices between 1995 and 2000. The Census 2000 publicity seemed to enhance the public's knowledge of and endorsement to cooperate with the census.
- Long-term survey trends showed increases in the public's belief that the Census Bureau actually protects data confidentiality; however no changes were shown in the public's trust in the Census Bureau to keep data confidential between 1999 and 2000, suggesting that census publicity had no effect upon public attitudes related to confidentiality issues.
- General privacy concerns showed a very small, yet statistically significant, decline between 1999 and 2000; however long-term trends showed small increases in public concerns about personal privacy and the loss of control over personal information. The proportion who viewed the census as an invasion of privacy did not change between 1999 and 2000.
- Trends revealed that increasing percentages of respondents expressed disapproval towards data sharing or providing one's social security number. Around 45 percent in 1999 and 2000 stated that it would bother them "a lot" if their census information was shared, a significant increase from prior years. Expressed willingness to provide one's social security number declined from 68 percent in 1996 to 55 percent in 1999, with no change in 2000.
- Relationships were revealed between Census 2000 survey respondents' attitudes and self-reported exposure to census-related media. Those exposed to both positive and negative media were more knowledgeable about the census, considered it more important, and were more likely to endorse an obligation to cooperate with the census than those with no media exposure. The group with only negative exposure had similar responses to those with both positive and negative media exposure, while more differences were shown between the group with only positive exposure and those who reported exposure to both types of census-related media.
- Attitudes were shown to predict respondents' behavior. High privacy concerns, negative views on the Census Bureau's confidentiality practices, disapproval of data sharing, and a lack of willingness to provide social security numbers, were reliable negative predictors of whether

Steiger, M. Montgomery, and R. Montgomery (The Gallup Organization), *Census 2000 Testing, Experimentation, and Evaluation Program, Final Report on the 1999-2000 Surveys of Privacy Attitudes*, December 10, 2001; Linda Brudvig, *Census 2000 Testing, Experimentation, and Evaluation Program: Analysis of the Social Security Number Validation Component of the Social Security Number, Privacy Attitudes, and Notification Experiment, Final Report*, January 13, 2003.

respondents returned their Census 2000 forms and provided mailing addresses that could be used to determine the return status of their forms. Reported demographics showed that non-White respondents were less likely to return their forms.

The Social Security Number Notification panel study results revealed that:

- The social security number request for one or all household members decreased mail response rates, yet the decreases were smaller than expected based on past research. Specifically, results suggested that the social security number request for all household members would decrease response by 2.1 percent in high census-coverage areas and 2.7 percent in low census-coverage areas compared to no request.¹⁵ The difference between the drop in response rates of the high- and low-coverage areas was not statistically significant.
- The request to provide social security numbers for all household members was associated with more missing data, yet there was no effect shown on missing data for Person 1.¹⁶
- Taken together, specific and general notification of administrative records use was shown to decrease mail response. Separately, however, specific notification did not demonstrate the predicted stronger effects than the general notification. Furthermore, there was not sufficient evidence to conclude that use of administrative records notification further discouraged response in the presence of a social security number request compared to notification alone.
- Notification was not shown to affect item nonresponse rates, whether the two notification types were grouped together or examined separately. Further, there were lower responses to the social security number item for Person 1 when the request was made without notification (contrary to prediction). This occurred regardless of whose numbers were requested (Person 1 only versus all household members) and regardless of the notification type. Also, there were no individual effects upon form completeness by type of notification.

Finally, the Social Security Number Validation panel study results showed that:

- The degree of accuracy for the social security numbers provided by respondents was high, with an overall match rate of 94.8 percent between the provided numbers and the Census Numident file (provided by the U.S. Social Security Administration). Only 5.2 percent of the reported social security numbers were considered invalid.
- The valid social security number rates for high- and low-coverage areas revealed a small, but statistically significant, 2.4 percent difference between the accuracy rates of respondents' reported numbers within the two coverage areas (high, 95.2 percent, and low, 92.8 percent).
- The valid social security number rates for Person 1 were not affected by whether a social security number request was made for Person 1 only or for all household members. Person 1 valid rates were high across the panels (about 96 to 97 percent). Results also revealed patterns of decreasing valid rates for Person 2, Person 3, and so on through Person 6 among the panels that requested numbers for all household members. Nevertheless, their valid rates were high, with a range of over 95 percent to the lowest rate of 80.2 percent for Person 6.
- Notification of administrative records use had no effect on the valid rates of provided social security numbers for Person 1. Also, there were no differences between the valid rates of those who received the specific notification type versus the general notification type.¹⁷

¹⁵ Low-coverage areas were composed of sections of the United States with high concentrations of non-White residents and renters, two groups that were associated with low response rates. The rest of the nation comprised high-coverage areas.

¹⁶ Person 1 is the adult respondent in the household—preferably one who owns or rents the housing unit—who fills out the census questionnaire on behalf of the entire household.

¹⁷ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, Appendix A: Summary Results of Individual Evaluations and Experiments, November 17, 2004, pp. A113–16.

Response Mode and Incentive Experiment (RMIE)

With the advent of new computer technologies to facilitate the collection of data, the Census Bureau included in Census 2000 an experiment designed to assess the effect on respondent behavior of options to answer the census by electronic means and incentives to do so. The RMIE evaluated the public's willingness to provide census data using computer-mediated data collection methods, including computer-assisted telephone interviews (CATIs), interactive voice response (IVR), and the Internet. The RMIE also evaluated the quality of data collected through such media. The ability of incentives, in the form of telephone calling cards, to promote the use of computer-mediated response options was also studied.¹⁸

For this experiment, the Census Bureau selected a random sample of households in the mailout/mailback universe. It divided the sample into two categories—low-coverage area and high-coverage area. While a selection of households in the sample served as a census control group—receiving a form and letter identical to those used in the national mailing—the remaining households in the sample received special instructions that gave them the choice of providing their census data either by completing the paper form or by using a computer-assisted method such as CATI, an IVR system using the Automated Spoken Questionnaire, or a Web-based survey. To encourage the use of one of these alternative response modes, the Census Bureau offered half of the households in the experimental groups an incentive—a 30-minute telephone calling card to be activated once the household provided its responses using the computer-assisted method.

RMIE also included an operation to follow up with nonrespondents of the census control group. During this follow-up, all the nonrespondent households were offered the opportunity to use a computer-assisted response mode to provide their census data. Half of these households received calling-card incentive offers. This component of RMIE evaluated the effect of incentives and response-mode alternatives on response among a group representing a population that is traditionally difficult to enumerate.

The last component of RMIE evaluated Internet usage. The agency conducted a telephone survey of those households that received the offer to complete the Internet version of the short form but opted to mail back the completed paper form. This survey explored the reasons why these respondents chose not to use the Internet option.

Based on the RMIE, the Census Bureau concluded the following:

- The Internet was an attractive alternative as a data-collection mode for the decennial census.
- The use of an incentive was an effective means of promoting the use of alternative response modes. However, some of this effect may have been attributable to the use of the insert that drew the respondent's attention to the availability of the alternative mode.
- Data quality was improved using the CATI mode (compared with mail), however this mode required substantial cost investments for hardware, software, and programmer and interviewer time.
- Without significant improvements in the voice-user interface, the IVR technology was probably not a viable alternative for Census 2010.
- The use of alternative modes did not increase overall response rates to the census.¹⁹

¹⁸ Sid Schneider, David Cantor, Paul Segel, Carlos Arieira, and Luu Nguyen, *Census 2000 Testing, Experimentation, and Evaluation Program: Response Mode and Incentive Experiment for Census 2000, Final Report*, October 25, 2002, pp. 1–2. For more information on CATI, IVR, and Internet data collection, see Chapter 5, “Data Collection.”

¹⁹ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, Appendix A: Summary Results of Individual Evaluations and Experiments, November 17, 2004, p. A119. For more information on the RMIE, see Jennifer Guarino, *Census 2000 Testing, Experimentation, and Evaluation Program: Assessing the Impact of Differential Incentives and Alternative Data Collection Modes on Census Response, Final Report*, July 10, 2001; and Rachel Caspar, *Results from the Response Mode and Incentive Experiment in 2000*, Census 2000 Testing, Experimentation, and Evaluation Program Synthesis Report No. 18, TR-18, March 2004.

Census 2000 Supplementary Survey (C2SS)

C2SS served as a large-scale demonstration of the operational feasibility of continuous measurement (ongoing data collection throughout the decade). In the late 1980s, the Census Bureau began to explore the use of a rolling sample design in the context of the decennial census, and as the following decade progressed, the agency acknowledged the need for more-frequently updated data. In 1994, the Census Bureau established the Continuous Measurement program to develop a method for collecting detailed demographic and housing data on a yearly basis. This program continued to evolve and expand, and out of this initiative emerged the American Community Survey (ACS). Testing of ACS data-collection methods began in November 1995 with surveys at four sites, using three modes of data collection—mailout/mailback, telephone nonresponse follow-up, and personal visit nonresponse follow-up.

By 2000, the Continuous Measurement program included 36 counties. To assess the operational feasibility of the ACS, the Census Bureau conducted the C2SS in 1,239 counties, of which 36 were the ACS test counties and 1,203 were new counties. While the ACS test sites used the proposed ACS sample design, the remaining counties in the C2SS used a sample design similar to the Current Population Survey (CPS)—a monthly demographic survey conducted by the Census Bureau for the Bureau of Labor Statistics. Data gathered from the CPS-based C2SS, conducted in the 1,203 counties, combined with the 36 ACS test counties, provided national-level data. Following 2000, the Census Bureau continued data collection activities in all of these counties to demonstrate the data's usability and reliability.

Despite competition from Census 2000 for resources and lack of experience with a nationwide workload, C2SS had sufficient staffing, carried out major operations as anticipated, and observed high response rates. The C2SS operation provided insight into activities needing improvement or revision, given the large increase in workload over the 1999 Continuous Measurement program. In particular, Telephone Questionnaire Assistance (TQA) and edit follow-up operations required more staff to handle the increase. The results of the C2SS demonstrated that full implementation of the ACS was not only operationally feasible, but would improve planning, simplify census design, and provide timely and relevant demographic and socioeconomic data to policymakers.²⁰

Ethnographic Studies

In the early 1970s, the Census Bureau began using ethnographic techniques to study survey coverage. With its establishment in 1984, the National Academy of Science's Panel on Decennial Methodology recommended that the Census Bureau undertake a series of participant observation studies to discern the behavioral processes that contributed to underenumeration. During the 1990 census, the agency conducted numerous ethnographic studies and evaluations focusing on issues such as language and illiteracy barriers, residential mobility, irregular housing and household arrangements, and resistance (active or passive) to outsiders. These 1990 studies examined population groups that included the homeless, migrant workers, African Americans, Latinos, American Indians, and Asians.

Through the combined efforts of personnel from the Census Bureau's Statistical Research Division (SRD), Planning, Research, and Evaluation Division (PRED), and various contractors, the Census Bureau conducted six ethnographic research projects as part of the TXE program and the Ethnography for the New Millennium program. Three were considered part of the TXE experimentation program and three were considered TXE evaluations (see Evaluation Program, Category J: Ethnographic Studies). Designed to improve coverage of selected segments of the population, these studies addressed enumeration challenges in the decennial census. Such issues included respondent sensitivities to privacy issues; cultural and social beliefs that influenced decennial census compliance; increased number of foreign-born persons and undocumented immigrants; increased

²⁰ U.S. Census Bureau, *Design and Methodology: American Community Survey*, TP67 (Washington, DC, GPO: 2006), pp. 2-4–2-5; Deborah H. Griffin and Sally M. Obenski, *Census 2000 Testing, Experimentation, and Evaluation Program: A Demonstration of the Operational Feasibility of the American Community Survey, Final Report*, September 28, 2001, pp. 1 and 18.

diversity in household type and housing arrangements; and behavior patterns of selected mobile populations. Census Bureau advisory committees' suggestions and prior experiences with ethnographic research guided the selection of topics and formulation of research questions for these studies.²¹

Privacy Schemas and Data Collection: An Ethnographic Account. This study examined the effects of concerns about privacy on participation in Census 2000 and other surveys. By conducting interviews with respondents in Washington DC, Boston, Chicago, San Diego, Los Angeles, Oakland, Miami, and Northern Virginia, researchers sought to elicit the reasoning process used by respondents to decide whether to participate in a survey or census and to decide how much information to provide. Researchers presented respondents with a series of vignettes in which a character was asked to share information in a variety of contexts (for example, private- and government-sponsored data collections) and using different data collection modes (for example, telephone survey, Internet request, or in-person interview). Through these vignettes, researchers gleaned information about respondents' views on the risks associated with sharing information and on the credence given to assurances of confidentiality.

The findings from this study indicated that privacy reactions are highly situational, varying with the context in which the request for information is presented and with the respondent's background and experiences with federal agencies and private surveys. This study also produced a descriptive model for understanding how respondents decided whether to divulge information. The model comprised three main parts: an assessment of the sponsor of the questions, an assessment of whether the questions were relevant to some legitimate purpose of the sponsor, and an assessment of risks and benefits of divulging information. While this decision model was widely followed in all groups, some differences emerged. Technologically sophisticated people, for example, were more comfortable with providing information on the Internet. Such respondents, however, also did not believe that it was possible for any institution to completely assure privacy or confidentiality to persons providing information.

Generation X Speaks Out on Civic Engagement and the Decennial Census: An Ethnographic Approach. This study examined the attitudes of members of Generation X about civic engagement, community involvement, government, and decennial census participation. For this study, ethnographers defined Generation X as persons aged 21 to 32 (born between 1968 and 1979), and they recruited respondents from "hard to reach" populations such as ethnic minorities, lower socioeconomic classes, immigrants, and alienated young adults. Researchers conducted 150 interviews, ten focus groups, a survey, and participant observation activities in a variety of locations among primarily "working-class" respondents with levels of education ranging from high school dropout to those in pursuit of Ph.Ds.²² Interview and survey questions were designed to gauge respondents' experiences with and views on civic responsibility.

Findings from this study indicated that skepticism and mistrust toward the government was pervasive among the Generation X respondents. However, while many respondents shared a considerable degree of cynicism about government civic engagement (for example, formal organizations and political activities) as well as a sense of alienation from national politics, such attitudes did not preclude respondents from seeing the value of participation in the census. Respondents often viewed the decennial census as a nonpartisan national resource and as an easy way in which a generation could give back to the community while empowering the community. While many also expressed concerns about the Census Bureau's statements regarding privacy and confidentiality, most were still willing to provide personal information.²³

²¹ Manuel de la Puente, *Census 2000 Ethnographic Studies*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 15, TR-15, March 2004, pp. 3–4.

²² Research for this study was conducted in Oregon, Illinois, Florida, Texas, Maryland, Virginia, and Washington, DC.

²³ Melinda Crowley, *Census 2000 Ethnographic Study: Generation X Speaks Out on Civic Engagement and the Decennial Census: An Ethnographic Approach, Final Report*, June 17, 2003. See also Manuel de la Puente, *Census 2000 Ethnographic Studies*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 15, TR-15, March 2004.

Complex Households and Relationships in the Decennial Census and in Ethnographic Studies of Six Race/Ethnic Groups. This study used a series of small-scale ethnographic studies to explore the range and functioning of complex households in six ethnic groups in the United States and to determine how well census response categories captured the diversity and complexity of household structure. Such studies were also designed to assess how well census methods, questions, relationship categories and household composition typologies describe the emerging diversity of household types; suggest revisions to the relationship question and response categories for the 2010 Census test cycle; and call for new research.²⁴ Researchers conducted a series of interviews with 25 households they deemed representative of their assigned ethnic group. The groups included in this study were drawn from the race and ethnic categories mandated by the U.S. Office of Management and Budget for the census and federal surveys. Participants in this study included African Americans in southeastern Virginia; Korean immigrants in Queens, New York; Latino immigrants in central Virginia; rural non-Hispanic Whites in western New York; Navajo Indians on an Arizona reservation; and Inupiaq Eskimos, known as the Inupiat, in Alaska.²⁵ During interviews, respondents first completed a mock census form and researchers observed how it was completed. Ethnographers then conducted semistructured interviews that included questions on demographic characteristics, coverage probes to identify potential omissions and erroneous enumerations, and open-ended questions on living situations and mobility patterns.

Five common themes emerged from these studies. The first noted that conceptual differences in the definition and application of the key concept “household” could potentially result in coverage errors. While the census definition of “household” included all people sharing one housing unit, some groups viewed the extent and depth of social interaction, rather than a shared physical structure, as the criteria for defining a household. This suggests that respondents were likely to use their own culturally defined criteria for deciding who to list on their census forms and may ignore, or not even read, the residence rules specifying who should and should not be counted.

Another common theme indicated that culture, language, and nationality could lead to a different understanding of census concepts, methods, and procedures. These included differences in naming customs, adoption practices, and kinship terms. Inconsistencies with how the census defines these terms, may affect the accuracy of counts and household data.

These studies identified three issues with relationship questions focusing solely on relationships to Person 1. First, interrelationships among others in the household can be masked and not identifiable, either from the form itself or the data produced. Second, the classification of household type may change depending on who is listed as Person 1, possibly distorting the distribution of household types that are used in developing programs, implementing the poverty definition, and allocating funding. Third, Person 2 may not be the biological parent of a coresident child. Ethnographers recommended development and testing of an individual-level question to identify all interrelationships in the household.²⁶

The fourth theme identified in these studies focused on mobility patterns. Mobility patterns and conceptions of who is a household member often may not be consistent with the census concept “usual residence.” Seasonal mobility, cross-national mobility, and permanent immigration can create ambiguities in determining where a person should be counted in the census.

The last theme running through the Navajo, African American, and Korean and Latino immigrant studies was a fear and mistrust of the government and its confidentiality pledges. Fears of losing

²⁴ The term “complex household” is a research category, not an official Census Bureau type of household. For this study, a complex household was defined as a non-nuclear family household, including nonrelatives, such as roommates and unmarried partners; more-distant relatives not listed on the census form, such as nephew/niece, cousin, brother-/sister-in-law; persons shared across households, such as children in joint custody arrangements and persons tenuously attached to more than one housing unit; and more than one family sharing a housing unit.

²⁵ For a summary of these studies, see Laurie Schwede, *Census 2000 Testing and Experimentation Program: Complex Households and Relationships in the Decennial Census and in Ethnographic Studies of Six Race/Ethnic Groups, Final Report*, August 27, 2003.

²⁶ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, Appendix A: Summary Results of Individual Evaluations and Experiments, November 17, 2004, p. A123.

benefits or leases, being deported, or having personal data misused were prevalent among participants. Researchers recommended expanding outreach efforts to encourage participation.

EVALUATION PROGRAM

The Census Bureau planned an ambitious program of formal evaluations for Census 2000. Using metrics from production activities and from data collected in field follow-up surveys, this program analyzed and measured the effectiveness of methods, procedures, operations and processes as well as the impact of new initiatives on data quality and the core census processes.²⁷ The Testing, Experimentation, and Evaluation (TXE) program also included operational assessments that provided accounting information (for example, total volumes and rates) for distinct operations, functions, and processes. The quality assurance (QA) programs instituted for some specific census operations also provided assessments.²⁸

The Census 2000 Dress Rehearsal, conducted in 1998, included evaluations of questionnaire design, field operations, data processing, and estimation. Over 40 of these evaluation studies informed the final Census 2000 design. For Census 2000, Census Bureau personnel submitted study plans for each proposed evaluation to an Evaluations Program Steering Committee. At the time of the census, the agency planned to conduct more than 140 evaluations. In early 2002, however, resource constraints prompted a reassessment of the evaluation program, reducing the total number of evaluations. Also, planned evaluations that overlapped with Executive Steering Committee for Accuracy and Coverage Evaluation Policy (ESCAP) analyses and documentation were canceled, as they were subsumed by the ESCAP reports.²⁹ The final count of evaluations was 87, organized into 18 broad categories. The Census Bureau began releasing the evaluation final reports in March 2002, with the final evaluation report released in September 2003. The Planning, Research, and Evaluation Division (PRED) also released a series of topic reports written by subject-matter specialists and one summary-level report to synthesize the findings of the evaluations, experiments, and other related research and to make recommendations for the 2010 Census.³⁰

Category A: Response Rates and Behavior Analysis

Mail response rates and mail return rates were important measures of participation in the census, with the former being used to determine the nonresponse follow-up (NRFU) workload.³¹ The 12 evaluations in this category focused primarily on respondent behavior and its impact on response rates. These evaluations assessed the effectiveness of assistance programs used in Census 2000, including questionnaire guides, the Census 2000 Web site, and Telephone Questionnaire Assistance (TQA). They also examined various modes of providing responses to the census in addition to mailout/mailback questionnaires. These included Internet Data Collection (IDC), Be Counted forms, and coverage edit follow-up returns.

Using data from customer satisfaction surveys, evaluators noted that the public responded favorably to initiatives such as TQA and IDC. They recommended, moreover, that the Census Bureau make more extensive use of electronic self-response modes in future censuses and encourage respondents to use these modes. Evaluators also noted that the Be Counted program successfully increased coverage among traditionally undercounted groups.

²⁷ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, November 17, 2004, pp. 2–3.

²⁸ Many of the QA programs involved relisting or reinterviewing procedures that were often conducted on a sample basis.

²⁹ ESCAP was a committee of senior Census Bureau officials charged with making a recommendation to the director regarding whether the official Census 2000 redistricting data should incorporate a statistical adjustment. Following the decision to not statistically adjust the redistricting data, the ESCAP conducted additional research and analyses to further assess the accuracy of the adjusted data and to inform a second decision, this one pertaining to possible nonredistricting uses of the data, including their incorporation in Census 2000 sample (long form) data products, intercensal estimates, and survey controls. This additional work by the committee was known as ESCAP II. The ESCAP and ESCAP II research and analyses are discussed in the “Coverage Measurement Programs” section of this chapter, and the documentation is available online at <<http://www.census.gov/dmd/www/EscapRep.html>> and <<http://www.census.gov/dmd/www/EscapRep2.html>>, respectively.

³⁰ Evaluation, topic, and summary reports are available online at <<http://www.census.gov/pred/www/>>.

³¹ For more information on mail response and mail return rates, see Chapter 5, “Data Collection.”

Category B: Content and Data Quality

The eight evaluations for this category focused on data completeness and accuracy, as well as questionnaire content and how it was interpreted by respondents. Data completeness was measured by computing imputation rates using substitution, allocation, and assignment, and by item nonresponse rates.³² Response variance, measured by the Content Reinterview Survey (CRS), also served as an indicator of data quality. This category also included assessing the documentation of the Master Trace Sample database established by PRED to trace response and operational data through the stages of Census 2000 processing. Lastly, these evaluations addressed responses to questions on race both stateside and in Puerto Rico.

Evaluations of imputation rates noted that almost 1.5 million households (1.39 percent of the occupied housing units) were substituted in Census 2000.³³ Within these households, the agency substituted over 3.4 million people, accounting for 1.26 percent of the 273.6 million people in housing units. Total item imputation rates (assignments plus allocations) for the 100 percent data items in Census 2000 ranged from 1.98 percent for the sex item to 5.48 percent for tenure (whether the housing unit is rented or owned).³⁴ Overall, the data completeness statistic indicated that about 97 percent of non-substituted person records contained at least four of the five 100 percent population items with nonimputed data.

The CRS re-asked the long-form questions to calculate an index of inconsistency for response variance. Of the 58 population characteristics evaluated by the CRS, 16 showed low inconsistency, 26 showed moderate inconsistency, and 16 showed high inconsistency. Of the 36 housing characteristic items measured, 5 showed low inconsistency, 15 showed moderate inconsistency, and 16 showed high inconsistency.³⁵

Census 2000 marked the first decennial census in which respondents were asked to indicate “one or more races.” To evaluate responses to race questions and compare the single-race methodology to the multiple-race methodology, the Census Bureau conducted the Census Quality Survey (CQS). The CQS contacted a sample of 55,000 addresses twice; once with “mark one race” instructions and again with “mark one or more races” instructions. Data gathered through the CQS allowed for comparison of the consistency of race responses. The CQS indicated that 40 percent of the non-Hispanic respondents who reported two or more races in Census 2000 also reported two or more races in the initial contact of the CQS. Similarly, 41 percent who reported two or more races in the census also reported two or more races in the recontact of the CQS. In contrast, 97 to 98 percent of those who reported a single race of White, Black, or Asian in Census 2000 reported the same race in the CQS.

Category C: Data Products

The Census Bureau carried out one formal evaluation on Census 2000 data products. For additional information about the data products and their dissemination, see Chapter 9, “Data Products and Dissemination.” This evaluation examined the effect of the agency’s disclosure-limitation procedure, also called data swapping or confidentiality edit, on the data products.³⁶ In data swapping, data from households with characteristics at variance with the area’s norm are swapped

³² For more information on imputation, see Chapter 6, “Data Capture and Processing.” Item nonresponse refers to whether there is an entry for a data item, regardless of it being an acceptable response. This includes apparent responses that are not valid answers or are inconsistent with other information for the person. In such cases, the entry was not accepted and the item was treated as a blank in the imputation process.

³³ Cases such as noninterviews where all of the 100 percent data items (so called because these questionnaire items are asked of all respondents and at all housing units) are imputed by the replication of data from a household of the same size with fully reported 100 percent data are called “whole household substitutions.”

³⁴ Assignments and allocations pertain to the imputation of a value for an individual data item when the response is missing or inconsistent with other responses. In “assignments,” the value is determined from other information reported for the person or housing unit. An “allocation” is carried out when an “assignment” cannot be made and uses the reported value from another person in the household or from a nearby housing unit.

³⁵ Paula J. Schneider, *Content and Data Quality in Census 2000*, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 12, TR-12, March 2004, pp. 18–20.

³⁶ Phil Steel and Laura Zayatz, “The Effects of the Disclosure Limitation Procedure on Census 2000 Tabular Data Products (Abridged),” Census 2000 Evaluation No. C.1, April 15, 2003.

with “paired” or “partnered” households in the area to reduce the risk of disclosure. The Census Bureau applied data swapping to tabulations of the edited 100 percent and sample data files to limit the possibility of disclosure of a respondent’s identity. The goal was to minimize the likelihood that an individual respondent’s answers could be identified; the risk cannot be eliminated altogether, unless the Census Bureau were to release no data on small areas. In implementing its disclosure limitation procedure for Census 2000, the Census Bureau strove to achieve the appropriate balance between protecting confidentiality and maintaining data quality.

Analyses of the resultant files indicated that the data swapping procedure was implemented correctly and consistently. For the 100 percent data records: (1) all those identified as having the highest degree of disclosure risk were swapped and (2) in only a small percentage of cells did the cell value change. For the sample data, a small percentage of records were swapped in each state; most records deemed as having a disclosure risk were swapped.

While the data swapping procedure for Census 2000 was successfully implemented, the evaluation noted that the Census Bureau should continue to conduct research on disclosure-limitation techniques.

Category D: Partnership and Marketing

The Census Bureau conducted formal evaluations of the Census 2000 Partnership and Marketing Program (PMP). The PMP evaluations measured the effectiveness of the PMP’s components and attempted to attribute the contributions of each to the relative success of Census 2000. Because the PMP’s contributions could not be measured directly, the analysis strategy relied on a simple behavioral model: attitudes and motivation are a function of the information individuals have about the decennial census. In short, the PMP attempted to convey the right message, at the right time, to impact response to the census.³⁷

The evaluation supported the belief of the Census Bureau and the PMP contractor (Young & Rubicam) that awareness and positive attitude toward the census should improve participation and response rates. However, despite the Census Bureau’s best efforts, a direct link between the PMP and improved response rates could not be established.

The PMP evaluations determined that many of the campaign’s initiatives had positive, though difficult to measure, influences on the outcome of Census 2000. These influences included an increased awareness of the census among hard-to-enumerate populations; greater support, participation, and funding for census-related activities by private organizations; and a questionnaire design and mandatory notice on the questionnaire envelope that likely contributed to increased census participation.

In conclusion, the Census Bureau determined that although the impact of the PMP could not be verifiably measured, the fact remained that Census 2000 was much more successful than predicted and more successful than the 1990 census. As a result, the evaluations supported the continuation of a PMP in the spirit of continuous improvement.

Category E: Special Places and Group Quarters

During Census 2000, the Census Bureau used special procedures to enumerate people living in group quarters such as college dormitories, nursing homes, correctional facilities, convents, group homes, migrant-worker dormitories, and emergency and transitional shelters. To document and analyze the effectiveness of these procedures, the Census Bureau conducted three evaluations focusing on group quarters (GQs) and service-based enumeration (SBE).³⁸

Conducted between April 1, 2000, and May 6, 2000, the GQ enumeration operation enumerated 7.8 million people living in 192,286 GQs throughout the United States. Of these, colleges and universities, correctional institutions, and nursing homes were the largest special places measured by number and percent of population. In its evaluation of GQ enumeration, the Census Bureau noted

³⁷ For more information, see Chapter 4, “The Partnership and Marketing Program.”

³⁸ Seven evaluations were originally planned for this category, but in 2002, four were canceled due to data limitations.

that more GQ questionnaires were completed from administrative data than by any other method and about 2.6 percent of all GQ person records required all characteristics to be imputed.³⁹ For 2010 planning, evaluators recommended expanding research on the use of administrative records, improving the process of creating address lists and the tracking of questionnaires from enumeration to data capture, and tailoring enumeration strategies to each major category of group quarters.⁴⁰

To enumerate selected service locations serving people without conventional housing, the Census Bureau conducted the SBE from March 27 to March 29, 2000, at shelters, soup kitchens, and regularly scheduled mobile food van stops. The operation also included the enumeration of targeted nonsheltered outdoor locations. The Census Bureau's evaluation noted that SBE appeared to be a successful method of including in the census people without conventional housing. SBE accounted for the tabulation of 283,898 people. Of these, 35,121 were included as a result of the Be Counted program. Given that 59.2 percent of the emergency and transitional shelter population reported one or more races other than White, evaluators recommended the use of SBE in 2010 to continue to aid in reducing the differential undercounting of minorities.⁴¹

Category F: Address List Development

The evaluation of address list development covered a broad spectrum of activities involved with building address files and the related geographic database, including field operations from which address information and related map updates were gathered. The address list development category included evaluations of the master address file (MAF) and the Topologically Integrated Geographic Encoding and Referencing (TIGER®) database. These evaluations included examination of the completeness and accuracy of address information in the MAF. A variety of census field and local/tribal partner operations were evaluated to measure the impact of each operation on the MAF and on the TIGER database. These operations included, but were not limited to, address listing, block canvassing, update/leave (U/L), list/enumerate (L/E), and multiple cycles of the Local Update of Census Addresses (LUCA) program. Combined, these field operations offered comprehensive address checks in rural and urban areas and were a primary source of address information used for MAF and TIGER enhancement. Additional evaluations focused on the geocoding accuracy of addresses in the census.

The series of operations used to build the address list in mailout/mailback (MO/MB) areas included the use of the 1990 census address list, information from the U.S. Postal Service (USPS), block canvassing, and information from local governments. Subsequent operations, such as non-response follow-up (NRFU), contributed to the completeness of the address list as well.

Areas with mail delivery to predominantly city-style addresses were referred to as “inside the blue line.” Areas with mail delivery to predominantly non-city-style addresses were referred to as “outside the blue line.” These areas were further delineated by specific types of enumeration areas. Different procedures were used to develop the Census 2000 address lists, depending on the designated type of enumeration area (TEA).⁴²

Address listing. The evaluation of the address listing operation for Census 2000 examined the operation's impact on creating the MAF for certain areas of the country. This evaluation considered the number, geographic location, characteristics, and quality of addresses listed during the operation. Stateside, about 22 million housing units were listed in the address listing operation, and an additional 1.4 million addresses were listed in Puerto Rico.⁴³

³⁹ See Chapter 5, “Data Collection” and Chapter 6, “Data Capture and Processing,” respectively, for more information on GQ enumeration and processing.

⁴⁰ Kimball Jonas, *Group Quarters Enumeration*, Final Report, Census 2000 Evaluation E.5, Revision 1, August 6, 2003, pp. v–vi.

⁴¹ Tracey McNally, *Service-Based Enumeration*, Final Report, Census 2000 Evaluation E.6, November 6, 2002, pp. iv–v.

⁴² Frank A. Vitrano, Robin A. Pennington, James B. Treat, *Address List Development in Census 2000*, Census 2000 Topic Report No. 8, TR-8 (Washington, DC: U.S. Census Bureau, 2004).

⁴³ The Census Bureau conducted the address listing operation from July 1998 to May 1999 and used the results to create the initial address list for areas that would be enumerated using update/leave (U/L) methodology during Census 2000. In the address listing operation, census enumerators identified the mailing address

Despite address listing occurring in mostly rural areas of the United States, over 73 percent of the units had complete city-style (house number, street name) addresses. About 14 percent of the units had incomplete or no address information, but location descriptions of the units were recorded for over 95 percent of those units. Using both city-style address information and location descriptions enabled enumerators to locate the units on the ground when they delivered the census forms during U/L and other census field operations. The presence of a map spot, a unique identifier for a housing unit within a block on a census map, was also crucial in locating a unit in rural areas. Over 99 percent of the addresses added through address listing (referred to as adds) had map spots.

Addresses eligible for the decennial master address file (DMAF) included those that represented potential residential housing units that were coded to census blocks and had map spots. Over 99 percent of the address listing adds were delivered to the DMAF, and approximately 94 percent of all address listing adds were included in the final Census 2000 counts.

In areas where most mailing addresses were city-style, the Census Bureau created the MAF by combining addresses from the 1990 census address control file with addresses in the USPS delivery sequence file (DSF). Approximately 43 percent of addresses added in address listing matched to addresses that were identified as residential on or before the September 1998 USPS DSF. About 280,000 blocks in U/L areas had all of their addresses match to the DSF. About 14 percent of these blocks had at least one unit listed during the address listing operation.

If a lister could not locate a unit on the ground, the lister was allowed two telephone callbacks to try to collect mailing address information during the address listing operation. In 36 of the approximately 3,000 counties in which address listing was done, three additional personal visit callbacks could be used to obtain address information. These 36 counties were the sites of the 1999 American Community Survey (ACS). The additional callbacks were made to maximize mail response in that survey. It appears that the additional callbacks may have contributed to the success of obtaining additional address information, although not in any significant manner.

Evaluators recommended that the Census Bureau reassess its methodology of delineating MO/MB versus U/L areas and noted that it may be reasonable in some Census 2000 U/L enumeration areas to use the DSF as a tool for building the address list.⁴⁴

Local Update of Census Addresses 98 (LUCA 98). The Census Bureau conducted the LUCA 98 program in MO/MB areas from May 1998 to June 2000. The Census Bureau invited local and tribal governments to participate. Those who participated were sent lists of housing units in the census blocks of their areas. The address list for LUCA 98 included addresses from various MAF sources (including the 1990 address control file), two USPS DSF deliveries, and the block canvassing operation. There were approximately 81.5 million addresses from these sources on the MAF that were eligible for review in LUCA. Governments updated the lists by adding, deleting, or correcting addresses. The Census Bureau then verified most of those updates.

Of the 17,424 governmental units eligible, 9,263 governments participated in LUCA 98. The housing units in these jurisdictions geographically covered approximately 92 percent of the housing units in all areas eligible for LUCA 98. Although about half of all eligible governments participated, a little more than a third provided updates in the form of adds, deletes, or corrections. Such a level of participation indicates that the Census Bureau should investigate ways to increase government participation, especially focusing on ways to aid governmental units in providing updates.

and physical location of addresses in areas where the Census Bureau believed problems were likely with developing an accurate mailing list and delivering census questionnaires through the mail. The enumerators also located each housing unit with a map spot on a block map and collected an occupant name and telephone number, when possible. All of Puerto Rico was canvassed during the address listing operation and was enumerated using U/L methodology. For more information on address listing, see Chapter 8, "Addresses and Questionnaire Printing and Mailing."

⁴⁴ Megan C. Ruhnke, "The Address Listing Operation and Its Impact on the Master Address File, Final Report," Census 2000 Evaluation F.2, January 30, 2002.

The evaluation concluded that smaller governments (as determined by the number of housing units in a government's jurisdiction in 1990) generally had lower participation rates than larger ones and that participation may have been hindered by insufficient resources or by assumptions that larger nearby governments were already updating addresses for the Census Bureau.

In total, LUCA 98 participants added 5,302,094 addresses to the MAF (a 6.5 percent increase in housing units in MO/MB enumeration areas), deleted (or declared nonresidential) 490,613 addresses, and corrected 2,762,050 addresses. Participating governments appealed 313,853 addresses. Approximately 505,530 addresses in Census 2000 were solely provided by LUCA 98.⁴⁵

Block canvassing. The block canvassing operation was one of the largest operations the Census Bureau conducted to update the MAF in preparation for Census 2000. The Census Bureau conducted the operation in winter/spring 1999 and required field listers to conduct a 100 percent canvass of residential addresses in areas containing predominantly city-style addresses. Results from block canvassing were used to assign each housing unit to one of six basic action-code categories: verify, add, delete, address corrected, geographic corrections, and add and verify.

Block canvassing listers added 6,389,271 addresses to their listing pages and deleted 5,146,320 addresses. Around 78 percent of the added units were valid housing units in Census 2000, and almost 24 percent of the deleted addresses were later enumerated as housing units in the census. About 96 percent of the addresses coded as existing by block canvassing ended up as valid housing units in the census. Also, 96 percent of all addresses sent to block canvassing to be verified showed consistent results between block canvassing and the census.

Although a relatively large number of block canvassing adds and deletes turned out to be inconsistent with final census results, the consistency between block canvassing and the census, as a whole, appeared to be relatively good. Not only did block canvassing improve the coverage of addresses on the MAF, but it also improved the geocoding of MAF addresses. Block canvassing played a significant role in correcting unit designations in multiunit basic street addresses. If the block canvassing listers had not checked individual addresses within multiunits, but only verified the number of units at the multiunits, the MAF would not have had this added improvement.⁴⁶

Local Update of Census Addresses 99 (LUCA 99). The Census Bureau conducted the LUCA 99 program in U/L and update/enumerate (U/E) areas from January 1999 to June 2000. Of the 30,375 functioning governmental units eligible to participate in the LUCA 99 program, 10,925 participated. Approximately 23,227,788 addresses from address listing (in the United States and Puerto Rico) were geocoded with a map spot and eligible for review in LUCA 99. The Census Bureau sent 2,186,765 addresses out for review to participating governments in the stateside LUCA 99 Recanvass operation. Field representatives verified that about 76 percent existed as residential units. They deleted approximately 6 percent of the addresses, determined that less than two-tenths of a percent were nonresidential, and made corrections to the remaining 18 percent of addresses on their lists.

The Census Bureau sent a total of 35,563 addresses out for review in Puerto Rico. Field representatives verified that about 93 percent of them existed as residential units. They deleted approximately 7 percent, and determined that less than one-tenth of a percent were nonresidential. There were no corrected addresses in Puerto Rico.

Field representatives for the LUCA 99 Recanvass updated the address list and added any unit that existed as a residential unit in the block, but was not already on the list. The 328,174 added addresses represented a 15 percent increase in housing units in U/L enumeration areas in the United States (excluding Puerto Rico) that were recanvassed. Field representatives added 9,874 addresses in Puerto Rico, about a 28 percent increase in housing units in areas that were recanvassed. Approximately 99.5 percent of LUCA 99 Recanvass adds in the United States and Puerto Rico were included on the initial census address list. About 85.2 percent of those adds were in the final census housing-unit inventory.

⁴⁵ Karen L. Owens, "Evaluation of the Local Update of Census Addresses 98 (LUCA 98), Final Report" Census 2000 Evaluation F.3, April 16, 2003.

⁴⁶ Joseph A. Burcham, "Block Canvassing Operation," Census 2000 Evaluation F.5, April 5, 2002.

LUCA 99 Recanvass field representatives deleted (or declared nonresidential) 145,378 addresses in the United States and 2,543 addresses in Puerto Rico. They corrected 388,838 addresses in the United States and Puerto Rico.

After receiving feedback from the Census Bureau, participating local governments could appeal specific addresses. Participants appealed 18,442 addresses. Approximately 54 percent (10,053) of the addresses appealed by local governments were included on the final census address list.

As a result of LUCA 99, evaluators recommended that the Census Bureau continue to pursue LUCA-type programs in non-city-style address areas for future censuses and tests, and that the Census Bureau should investigate ways to increase government participation in LUCA programs.⁴⁷

Update/leave (U/L). The Census Bureau used U/L in areas with some addresses that were not city-style. In the U/L operation, enumerators hand-delivered questionnaires with preprinted address labels to every housing unit on the U/L address list. Any existing housing unit that was not listed on the address register also required a questionnaire. In such cases, the questionnaire was hand-addressed and hand-delivered to the housing unit, and the housing unit's address added to the address register. Staff also made other updates to the address list and to the maps during the U/L operation.⁴⁸ The U/L evaluation assessed the effectiveness and value of the operation to the census-taking process.

The U/L operation included 23,525,257 addresses stateside and 1,471,225 in Puerto Rico. These numbers represent any address that had either a labeled questionnaire or a hand-addressed questionnaire. Questionnaires were to be distributed to all housing units appearing in U/L areas. Some of the addresses on the U/L address list were deleted as nonexistent or nonresidential in the U/L operation, and the labeled questionnaires were not delivered.

Stateside U/L operations added 1,644,174 addresses, while 111,787 addresses were added during U/L in Puerto Rico. The number of corrections in stateside areas was 9,045,814, with 751,156 in Puerto Rico. Not every address added in the U/L operation was included in the census. Some records were not included because they did not contain sufficient address information for adding to the address list or data sufficient to be assigned to a block. Other added records were found in subsequent operations to represent housing units that did not exist in the designated block, either because the unit was nonexistent or because the unit existed in another block. Of the 1,644,174 U/L adds in the United States, 85.2 percent were in the final census counts. In Puerto Rico, 83.7 percent of the 111,787 added addresses were included in the counts.⁴⁹

Urban update/leave (UU/L). The Census Bureau conducted the UU/L operation from March 3 to March 31, 2000. The objective of the operation was to improve coverage by improving the deliverability of questionnaires and updating address information and census maps. The UU/L operation targeted areas deemed unsuitable for MO/MB, which included multiunit buildings where the USPS delivered the mail to drop points instead of individual unit designations and urban communities where, despite the existence of city-style addresses, many residents picked up their mail at post office boxes. The UU/L operation relied on authorities in the local regions to identify areas based on their knowledge of whether the USPS could adequately deliver the census questionnaires.⁵⁰

⁴⁷ Karen L. Owens, "Evaluation of the Local Update of Census Addresses 99 (LUCA 99), Final Report," Census 2000 Evaluation F.6, May 14, 2002.

⁴⁸ Non-city-style addresses, such as rural route and box or post office box, are often not linked to the physical location of the housing unit. When there is only a location description for a unit but no address, mail delivery of the questionnaire is not a possibility. U/L areas were primarily rural, but not too remote or sparsely populated. Designation of U/L areas was made by block. In Puerto Rico, U/L was the sole enumeration method. For more information on U/L, see Chapter 5, "Data Collection" and for information on U/L in Puerto Rico, see Chapter 12, "Puerto Rico and the Island Areas."

⁴⁹ Robin A. Pennington, "Evaluation of the Update/Leave Operation, Final Report," Census 2000 Evaluation No. F.10, June 6, 2003.

⁵⁰ In UU/L areas, enumerators delivered the census questionnaires and updated address registers and census maps, concurrently. Residents were asked to complete and mail back their census questionnaires. Eight regions participated in UU/L: Atlanta, Boston, Chicago, Dallas, Denver, Detroit, Philadelphia, and Seattle. Twelve states and Washington, DC, had UU/L areas. Nationwide, 12,843 blocks were covered by urban U/L. Almost 60 percent of these blocks contained housing units. The MAF had 314,059 residential addresses in

UU/L contributed to the success of Census 2000 by improving the address list and successfully targeting hard-to-enumerate areas. Of the 267,005 addresses in the address registers, 18.1 percent were updated. There were 13,131 additions during questionnaire delivery, a 4.9 percent increase to the addresses printed in the address registers.

For 2,114 blocks, 75 percent or fewer of the housing units in the block matched the DSF. These blocks contained 15.3 percent of the housing units in UU/L areas. Such blocks would presumably present mail delivery challenges for the USPS.

Less than 1 percent of UU/L housing units were drop-delivery; that is, mail delivered to a central location instead of to individual units of a multiunit structure. While these addresses were included in UU/L, they did not make up a large proportion of the UU/L housing units in the census. Furthermore, the variable used to identify drop-delivery status was not robust.

Matching the Census 2000 tracts to the planning database, 189,045 addresses, or 79.4 percent of the UU/L housing units in the census, were in census tracts that could be matched between the 1990 census and Census 2000.⁵¹ Close to one-quarter of the housing units in the census with hard-to-count scores were in the hardest hard-to-count class.

Persons under 18 years old, African Americans, and renters were over-represented in UU/L areas as compared to the nation. These traditionally undercounted persons were enumerated by mail at lower percentages than the average household or persons in UU/L areas.⁵²

Update/enumerate (U/E). The U/E method targeted communities with special enumeration needs and areas where most housing units may not have had house-number and street-name mailing addresses between March 13 and June 5, 2000. These included resort areas with high concentrations of seasonally vacant housing units, selected American Indian reservations, and colonias.⁵³ This evaluation examined the extent of address updating, descriptive statistics of the addresses, demographic characteristics of the households and people living in U/E areas, and timing and cost of the operation.

The U/E operation improved the address list and demonstrated that areas suited to field enumeration were identified. Of the 926,861 U/E addresses in the address registers, 37.2 percent were updated. Corrections (change in the address), which were the most frequent updates, were made to 284,127 addresses. The remainder of the updates were nearly all deletions. There were 129,692 U/E additions during field enumeration, a 14.0 percent increase to the addresses printed in the address registers.

For 71.9 percent of blocks, no more than 25 percent of the housing units in a block matched the DSF. These blocks contained 60.6 percent of the U/E housing units. Such blocks would presumably present mail delivery challenges. Of the addresses in the census, 15.2 percent had no address information; that is, the housing unit was missing the house number, street name, rural route, or post office box information.

Using the planning database in a similar way as described above in the “Urban update/leave” section, the Census Bureau matched the Census 2000 tracts to the planning database and found that 59.2 percent of the U/E addresses in the census were in tracts that matched. The matching indicated that about one-quarter of the addresses were in the top three hard-to-count classes, but few

UU/L blocks. After removing known duplicates, there were 310,114 addresses. Of the 310,114 addresses, 280,086 addresses, or 90.3 percent, were delivered to the DMAF. Ultimately, 238,216 addresses, or 85.1 percent of the DMAF addresses, were enumerated in the census as either occupied or vacant housing units. For more information on UU/L, see Chapter 5 (“Data Collection”).

⁵¹ The planning database provided a 1990 census tract-level hard-to-count score, a composite measure of characteristics correlated with success in counting people. Evaluators classified each hard-to-count score into one of ten hard-to-count classes.

⁵² Miriam Rosenthal, “Urban Update/Leave, Final Report,” Census 2000 Evaluation F.11, October 3, 2002.

⁵³ In U/E areas, enumerators updated their address registers and census maps and enumerated the housing unit at the time of their visit. LCOs, using general guidelines, designated areas for U/E. Every regional census center (RCC) except Detroit had areas enumerated using the U/E methodology. Thirty-five states had U/E areas. Nationwide, 183,889 blocks were covered by U/E and 75,827 of these blocks (41.2 percent) contained housing units. The MAF had 1,169,090 residential addresses in U/E blocks, after removing known duplicates. Of the 1,169,090 addresses, 90.4 percent were delivered to the DMAF. Ultimately, 956,214 U/E addresses (90.5 percent of the DMAF addresses) were enumerated in the census as either occupied or vacant housing units. For more information on U/E, see Chapter 5, “Data Collection.”

addresses (0.6 percent) were in the bottom two hard-to-count classes; thus, U/E was not limited to the most difficult hard-to-count classes. These results show that the Census Bureau followed the 1995 Census Test recommendation not to target U/E based on hard-to-enumerate criteria.

The average household size in U/E areas was 2.9 persons, compared to 2.6 persons nationally. The U/E vacancy rate of 38.7 percent was higher than the national vacancy rate of 9.0 percent. Most vacants were seasonal vacants. Of occupied housing units, 76.1 percent were owned, compared to 66.2 percent nationally. Of persons, 49.6 percent were male, compared to 49.1 percent nationally; 31.9 percent were under 18 years old, compared to 25.7 percent nationally; 23.6 percent were Hispanic, compared to 12.5 percent nationally; 1.5 percent were African American, compared to 12.3 percent nationally; and 27.7 percent were American Indian/Alaska Native, compared to 0.9 percent nationally.⁵⁴

List/enumerate (L/E). List/enumerate (L/E) was an operation used in sparsely populated areas of the country during Census 2000. Census enumerators canvassed assigned areas and were given census maps for these areas. The enumerators listed addresses within their areas on blank address register pages, located the addresses on census maps (map spotting), and for each address conducted an interview to collect census information. The operation, which included reinterview and field follow-up components, was carried out from mid-March 2000 to the beginning of July 2000.

L/E added 392,368 addresses nationwide to the MAF. Of these addresses, 391,276 met the eligibility criteria to be in the census. This is about 99.7 percent of all added L/E addresses. Of the addresses eligible to be in the census, 389,749 were actually included in the final census count. This represents 99.6 percent of the eligible L/E addresses and 99.3 percent of all added L/E addresses.

A total of 47,927 blocks had at least one L/E address. Of these blocks, 4.7 percent had all of their addresses recognized by the USPS. This indicates that these blocks could have possibly been converted to the MO/MB enumeration methodology. These blocks contained 1.4 percent of the addresses added during L/E.⁵⁵

An assessment of addresses on the MAF “missing” in the census or geocoded to the wrong collection block. One of the outcomes of the Accuracy and Coverage Evaluation (A.C.E.) was a representative sample of addresses that were coded as “missing” from the census. This evaluation conducted additional research to better understand these “missing” addresses and to examine the reasons for their status of “missing” after the A.C.E. final housing unit work was completed.⁵⁶ One of the reasons the A.C.E. coded addresses as “missing” from the census was that the addresses were incorrectly geocoded in the census to a collection block outside of the scope of the A.C.E.’s geographic search area. Thus, evaluators tried to match the addresses coded as “missing” to all nonduplicate housing units on the MAF, which included a larger geographic search area than the one used by the A.C.E. Evaluators also searched for matches in the tract that included each address and in all surrounding tracts. The main focus in understanding these “missing” addresses was to determine if they were actually included in the census as housing units, but were incorrectly geocoded to a collection block outside of the A.C.E. geographic search area. Given that matching was not limited to census addresses, but included all nonduplicate housing units on the MAF, evaluators were able to examine addresses that were on the MAF or the DMAF but were excluded from the census.

About 8,900 of the sample units coded as “missing” by the A.C.E. were matched to units on the MAF during this evaluation. About 4,800 of them were matched to addresses that were included in Census 2000. Of those census matches, about 3,100 were geocoded in error in the census to a collection block that was different than the block provided by the A.C.E. The other 1,700 units were matched to census addresses that were geocoded to the same block as the A.C.E. “missing” addresses.

⁵⁴ Miriam Rosenthal, “Update/Enumerate: Final Report,” Census 2000 Evaluation No. F.12, December 10, 2002.

⁵⁵ Kevin J. Zajac, “List/Enumerate: Final Report,” Census 2000 Evaluation No. F.13, May 23, 2002.

⁵⁶ Megan C. Ruhnke, “An Assessment of Addresses on the Master Address File ‘Missing’ in the Census or Geocoded to the Wrong Collection Block,” Census 2000 Evaluation No. F.15, August 19, 2003.

There are two primary reasons that these census units were not included in the census address list used for the A.C.E. address matching. The first reason is that some of these units were identified as potential duplicates during the Census 2000 housing unit unduplication operations and were therefore kept out of the A.C.E. final housing unit matching operation. About 78 percent of the matches to in-census units in the same block were potential duplicates that ultimately were reinstated in the census. The remaining 22 percent of the in-census matches to A.C.E. “missing” units in the same block were not reinstated duplicates. A reason that these units were excluded from the address list used for the A.C.E. address matching is that they were not geocoded to an A.C.E. sample block at the time of the final housing unit matching, but were moved into an A.C.E. sample block in time for evaluation work.

Of the approximately 8,900 sample addresses coded as “missing” by the A.C.E. that matched to the MAF in this evaluation, about 4,000 were not included in Census 2000. That is, these units were listed and confirmed as good, residential addresses during the A.C.E., but the Census Bureau’s rules for creating the DMAF and the 100 percent census unedited file excluded them from the census. Those units represent a weighted estimate of 1.3 million units coded as erroneously excluded from the census as measured by the A.C.E. and this evaluation.

About 28 percent of the cases coded as erroneously excluded units were never delivered to the DMAF. The Census Bureau’s rules for developing the Census 2000 address frame provided a number of reasons units on the MAF would have not been sent to the DMAF. One of the reasons a unit would not be included on the DMAF was its coding by the USPS as nonresidential on the DSF. The Census Bureau excluded those addresses from the original census address list to avoid the imprudence of mailing questionnaires to all nonresidential addresses. The Census Bureau relied on field listing operations to add those units that were actually residential by Census Bureau definitions.

About 49 percent of the cases coded as erroneously excluded units were on the DMAF, but were deleted during the “kill process.” The goal of the kill process was to identify units that were most likely bad addresses (for example, a unit for which no census form was received and that was deleted in both the NRFU and coverage improvement follow-up [CIFU] operations) and remove them from the census.

About 22 percent of the cases coded as erroneously deleted units were on the DMAF but were determined to be potential duplicates during the housing unit unduplication operation through address- and person-matching algorithms. The Census Bureau ultimately decided to exclude those units from Census 2000. The amount of erroneous deletions from the unduplication operation as measured in this evaluation is potentially overstated. This comes from the fact that the A.C.E. may have coded a unit as missing from the census, when the unit was actually included in the census with a different form of the address. The unduplication operation may have recognized the duplication but removed the version of the address that the A.C.E. listed.

The estimated percentage of census addresses that were geocoded to the incorrect Census 2000 collection block was 4.8 percent (standard error of 0.3 percent). The estimated percentage of geocoding error in the census was significantly higher in MO/MB enumeration areas (5.5 percent) than in U/L (1.7 percent) or L/E areas (1.2 percent).

Geocoding error was more prevalent among housing units in multiunit structures. Housing units in both small and large multiunit structures had a significantly higher geocoding error estimate than single units or housing units in two-unit structures. Additionally, large multiunits (housing units in structures with ten or more units) had a significantly higher geocoding error estimate than small multiunits (housing units in structures with three to nine units). The geocoding error estimate for both single housing units and two-unit structures was about 3 percent, for small multiunit structures about 5 percent, and for large multiunit structures, about 11 percent. Geocoding errors were expected to be higher for units in multiunit structures because geocoding error is a structure-based problem. Geocoding the structure to the wrong block causes every unit in that structure to be geocoded to the wrong block. The larger the structure, the larger the number of geocoding error cases if the structure is geocoded to the incorrect block.

Geocoding error of census addresses was less frequent in certain regions of the country. The geocoding error estimate for the Midwest (3.8 percent) was significantly lower than the geocoding error estimate for the South (5.7 percent). There were no other significant differences. Geocoding error estimates also differed for some of the regional offices (ROs). The Boston and Kansas City ROs both had significantly lower geocoding error estimates than the national estimate of 4.8 percent.

Evaluation of the block splitting operation for tabulation purposes. The evaluation of the block splitting operation for tabulation purposes measured the percent of the country affected by collection blocks that were split for tabulation purposes and the accuracy of that block splitting.⁵⁷ Collection blocks, geographic areas that are usually defined by visible features, were used by the Census Bureau to conduct field operations. Often, collection blocks crossed governmental unit boundaries, such as city and town or other required data tabulation boundaries.

At the end of Census 2000, the Census Bureau redefined census collection blocks for tabulation of census data by recognizing the boundaries of governmental units and other geographic entities. One of the steps needed to achieve this involved using an automated system to split collection blocks in certain situations. This block splitting process was based on address ranges and map spot information in the TIGER database. To evaluate the block splitting process, evaluators selected a sample of 1,000 collection blocks for field verification that had at least one tabulation boundary that split the block. Field representatives determined whether the housing units in these blocks were allocated to the correct side or the wrong side of each tabulation boundary.

About 916,000 blocks out of the 5.1 million blocks in the country were split for tabulation purposes. A total of 282,457 blocks formed the sampling universe used to evaluate the block splitting process. The 633,337 split blocks excluded from the sampling universe were either located in remote Alaska or in Puerto Rico, or were split by the boundaries of special-purpose governmental or administrative entities such as school districts, split by the boundaries of statistical entities, or contained no housing units or group quarters. Remote Alaska and Puerto Rico were excluded from the evaluation to minimize cost. Boundaries of special-purpose governmental, administrative, and statistical entities were excluded because this evaluation relied on the knowledge of residents of the block, and they would not necessarily know where these types of boundaries existed in their blocks. Split blocks that contained no housing units or group quarters were excluded because the purpose of the evaluation was to measure the error associated with placing housing units and group quarters in the wrong tabulation block. The estimated number of blocks that fell into each of these categories was not available, but the sum total was 633,337 blocks. A little more than 10 percent of the 115.5 million housing units in the country were located in the split collection blocks in the sampling universe.

Results showed that over 26 percent of these split collection blocks in the sampling universe contained at least one housing unit allocated to the wrong side of the tabulation boundary. Although this percentage was high, split collection blocks with at least one housing unit allocated to the wrong side of a tabulation boundary represented less than 2 percent of the collection blocks in the country. This meant that of the 12 million housing units in the split collection blocks in the sampling universe, 3.65 percent were allocated to the wrong side of a tabulation boundary. These errors represented 0.37 percent of the housing units in the country. For the group quarters in the sample, none were allocated to the wrong side of a tabulation boundary. Although the estimate of the number of group quarters allocated to the wrong side of a tabulation boundary was zero, the Census Bureau could not conclude that no group quarters were in error throughout the country. The preliminary August 2002 results from an administrative program in which the Census Bureau received input from local governmental entities showed that 1,867 group quarters in the country were in fact allocated to the wrong side of a tabulation boundary. This is less than 1 percent of all group quarters.

For this evaluation, collection blocks were categorized in the MO/MB, UU/L, and urban UU/E enumeration areas as “inside the blue line.” The term “inside the blue line” refers to areas where almost all mail delivery was to city-style addresses. Except for Remote Alaska, all other types of

⁵⁷ Somonica Green and Cindy Rothhaas, “Evaluation of the Block Splitting Operation for Tabulation Purposes: Final Report,” Census 2000 Evaluation No. F.16, Revision 1, April 7, 2004.

enumeration areas were categorized as “outside the blue line.” This term refers to areas where mail delivery was to non-city-style addresses. A mixture of city-style and non-city-style addresses occurred in some types of enumeration areas, especially those “outside the blue line.”

For the housing units affected by block splitting, the percent in error for enumeration areas “inside the blue line” was comparable to the percent in error for enumeration areas “outside the blue line.” For housing units affected by block splitting, fewer than 4 percent of the 11.1 million housing units with city-style addresses and fewer than 3.5 percent of the 773,000 housing units with non-city-style addresses were allocated to the wrong side of a tabulation boundary. The percent in error for both address types in the country was the same (0.37 percent).

Category G: Field Recruiting and Management

Following Census 2000, the United States Census Bureau contracted Westat to conduct an evaluation of its recruiting and management performance at 519 of 520 local census offices (LCOs). As part of its study, the evaluation reviewed pay (relative to local pay), recruiting goals, area characteristics, and managerial turnover in an attempt to identify deficiencies and potential corrective measures.

To perform the evaluation, Westat compared the LCOs in February 2000, when the majority of LCOs had reached recruitment goals, to April 2000. Individual LCOs were categorized by performance, retention, and workload, as well as certain LCO area characteristics. Through regression analysis, Westat drew conclusions about LCO recruiting and management.

Westat’s evaluation showed considerable variation in recruiting performance across LCOs; however, despite expectations, the LCOs substantially exceeded recruiting goals. The key to LCO recruiting success was largely attributed to enumerator pay and LCO management.

Management turnover, including resignations, termination for cause, or leaving for any other reason, during the recruiting period was associated with about a 12 percent reduction in the number of recruits. Such reductions would likely be avoided if management issues are resolved quickly and existing managers are trained and supported to respond to unanticipated challenges.

Finally, Westat noted that the variations in recruiting performance could usually be balanced by redistributing resources, including the hiring of recruiting assistants and use of special mailings to areas where goals were not being met. However, Westat noted that even among those LCOs that failed to meet recruiting goals, only five fell substantially below 70 percent of their goals and that every LCO had at least 3.25 applicants for each enumerator position to be filled.

Category H: Field Operations

During Census 2000, the Census Bureau conducted a variety of field operations designed to curb problems with questionnaire delivery and enumeration and to obtain census data from individuals who had not responded to the census by April 18, 2000. The seven evaluations in this category assessed the effectiveness of field data collection operations, including field verification, nonresponse follow-up, Questionnaire Assistance Centers, and the first use of U/L enumeration in Puerto Rico.⁵⁸ Analyses in this category also examined efforts to use special enumeration methods, such as blitz enumeration and team enumeration, and the use of local facilitators to count populations considered hard to enumerate.

The field verification operation sent enumerators to visit the locations of units without a confirmed census address (that is, addresses without an assigned census identification number) to verify their existence before Census 2000 included the addresses. Such non-ID responses came from the Be Counted program, Telephone Questionnaire Assistance, service-based enumeration, group quarters enumeration, military/maritime crews of vessels enumeration, military enumerations, and in-movers/whole-households programs. During Census 2000, 884,896 cases were sent to field verification. Of these, enumerators coded 51 percent of the assigned addresses as valid

⁵⁸ For more information on the enumeration in Puerto Rico, see Chapter 12, “Puerto Rico and the Island Areas.”

living quarters, 35 percent as nonexistent, and 14 percent as duplicates. Overall, 49.2 percent of the addresses without a confirmed census address (non-ID cases) were coded as valid census addresses, and 52.9 percent of the addresses deleted in two or more previous operations (double deletes) for which the Census Bureau received a return were coded as valid addresses. Evaluators noted that while the field verification operation provided useful information for the overall census address files, further research into the source of census duplicates and the impact of additional response methods would prove beneficial to 2010 Census field verification planning efforts.⁵⁹

The Census Bureau conducted nonresponse follow-up (NRFU) in mailback areas between April 27 and June 26, 2000, to obtain completed questionnaires from households that had not responded by mail, through the Internet, or by Telephone Questionnaire Assistance. Evaluators observed that of the 26.4 million occupied housing units in the NRFU universe, 0.4 percent had no population count. Approximately 4.2 million housing units were enumerated multiple times, mostly through NRFU and by a paper mail-return questionnaire. Additionally, some housing units had an unrealistically large number of continuation forms (as many as 99) attached. Evaluators recommended more stringent real-time monitoring of the NRFU workload to reduce the number of cases with unknown population counts or lost returns. They also recommended periodically removing from the NRFU workload addresses for which questionnaires had been returned late to reduce multiple data captures; implementing a sufficient quality assurance program to ensure the accuracy of NRFU production files; and using proper enumeration techniques to prevent the need for recounts.⁶⁰

For Census 2000, a total of 23,556 Questionnaire Assistance Centers (QACs) were established. Approximately 60 percent of these centers collected information. Of the respondents who needed assistance, most asked for help in completing the short form.⁶¹

Category I: Coverage Improvement

The coverage improvement evaluations examined various Census 2000 operations designed to improve the coverage of both housing units and people in the census. Following the mailback efforts to complete the census, the Census Bureau conducted a series of operations to ensure that people were counted at their correct Census Day address, to confirm the status of housing units that were deleted or enumerated as vacant, and to ensure the inclusion of all people in a household when the returned form showed discrepancies in the number of people enumerated. These operations included coverage edit follow-up (CEFU), follow-up of specific cases enumerated during nonresponse follow-up (NRFU), and coverage improvement follow-up (CIFU).

Designed to increase within-household coverage and improve data quality, CEFU resolved 2,544,072 cases. Of these, 55 percent required follow-up for large-household cases, and the remaining were count-discrepancy cases. This operation resulted in a net loss of 105,199 people compared to the originally completed Census 2000 self-response forms. Although the net change to the census was a decrease in population, the accuracy of Census 2000 was improved.⁶²

Evaluators also assessed the whole household usual home elsewhere (WHUHE) and mover probe questions used during NRFU. The WHUHE probe, designed to improve questionnaire coverage, was used to determine if all members of a household on the day of the interview had another residence where they lived most of the time. During NRFU, enumerators completed a total of 151,775 questionnaires for WHUHE households to help determine usual place of residence. Of these returns, 58,027 matched to an existing address on the DMAP; 55,286 were geocoded but did not match to an existing address; and 38,462 could not be geocoded or matched to an existing address. About 29,300 people were not enumerated by other operations and were added to the

⁵⁹ Michael Tenebaum, "Assessment of Field Verification: Final Report," Census 2000 Evaluation No. H.2, July 24, 2001.

⁶⁰ Darlene A. Moul, "Nonresponse Follow-up for Census 2000," Census 2000 Evaluation No. H.5, July 25, 2002, pp. vi–vii.

⁶¹ John Jones and Diane F. Barrett, "Questionnaire Assistance Centers for Census 2000: Final Report," Census 2000 Evaluation No. H.4, June 25, 2003, pp. ii–iv.

⁶² Dave Sheppard, "Coverage Edit Follow-up: Final Report," Census 2000 Evaluation No. I.1, July 29, 2003.

census by the WHUHE probe. The mover probe on questionnaires used in NRFU allowed enumerators to identify households that moved into the housing unit after April 1, 2000, and did not return a census questionnaire for their Census Day address. Of the 105,480,101 occupied housing units enumerated in Census 2000, 22,850 (0.02 percent of the total U.S. occupied housing unit count) would not have been enumerated without the mover probe.⁶³

The CIFU operation was designed to improve coverage of housing units in the MO/MB, U/L, and UU/L areas. The workload (including Puerto Rico) consisted of 8,854,304 housing units, most of which were classified as vacant or delete in NRFU. As a result of CIFU, approximately 21.9 percent of the vacant units were converted to occupied. These converted units resulted in a net gain of approximately 3.1 million people. Approximately 18.1 percent of the deletes were converted to vacant.⁶⁴

Category J: Ethnographic Studies

Comparative ethnographic research on mobile populations. Given the prominence of residential mobility in the United States, mobile groups present special enumeration challenges to the Census Bureau. Some Americans have unstable living conditions due to economic factors (for example, unemployment, low income, and/or high rent), while others choose a life of mobility, traveling for business or pleasure. As part of the Census 2000 Testing, Experimentation, and Evaluation program, the Census Bureau commissioned four ethnographic studies of selected mobile populations to gain insights into the characteristics and behaviors that made such groups difficult to enumerate and to provide suggestions for how best to tailor enumeration methods to address these difficulties.

Chosen primarily for their excessive mobility, the groups examined in these studies included urban gang members, Irish Travelers in Mississippi and Georgia, Arizona Snowbirds, and American Indians in the San Francisco Bay area. In addition to their mobility, each group exhibited characteristics that made the members hard to enumerate using traditional methods. Gang members often do not have a place of their own and frequently stay with a variety of different people. They also have a strong aversion to the government, making them less likely to participate in the census. Irish Travelers are historically nomadic people who have more recently settled into permanent communities. Their use of aliases, suspicion of outsiders, and tendency to change living location on a regular basis made them particularly difficult to enumerate. Arizona Snowbirds are seasonal residents in the Sunbelt who typically travel and camp during the winter months in the southwestern United States or travel year-round in recreational vehicles (RVs). Given that most maintain a permanent residence elsewhere, establishing residency status for this population according to census residence rules can be problematic. Lastly, American Indians living in the urban San Francisco Bay area have households that are often fluid in composition, and unlike their counterparts on reservations, urban American Indians tend not to be geographically concentrated. While many are homeless, others choose to live a mobile life either for work or pleasure.

Through interviews and observations, these studies identified several barriers to enumeration common among these groups. Residential mobility often made residents hard to contact using traditional enumeration methods. Such mobility and, in some cases, irregular household arrangements, made it difficult for many individuals to provide a specific place of residence using the residence rules presented on the form. Another barrier to enumeration stemmed from a broad sense of distrust in government agencies. Many in these groups feared that information provided to the Census Bureau would not be kept confidential. For those engaged in illegal or unconventional activities, this prompted a reluctance to divulge any information for fear that doing so might result in some penalty or prosecution if the information fell into the wrong hands. Irregular and complex household arrangements made it unclear to respondents whom they should classify

⁶³ Mark A. Viator and Nicholas Alberti, "Evaluation of Nonresponse Follow-up—Whole Household Usual Home Elsewhere Probe: Final Report," Census 2000 Evaluation No. I.2, February 20, 2003, pp. 4–5; and Don Keathley, "Evaluation of Nonresponse Follow-up—Mover Probe: Final Report," Census 2000 Evaluation No. I.3, March 29, 2004, pp. 4–5.

⁶⁴ Darlene A. Moul, "Coverage Improvement Follow-up: Final Report," Census 2000 Evaluation No. I.4, May 9, 2003.

as a household member. Disinterest also presented challenges to enumeration efforts. For many in these groups, the Census Bureau's outreach efforts had little impact. Residents either were not exposed to the campaign or chose not to believe the claims made in it.⁶⁵

To overcome some of these barriers to enumeration, ethnographers recommended strategies to tailor outreach and enumeration methods to these groups. Researchers encouraged the continued and increased use of community-based organizations and direct outreach to hard-to-enumerate populations in order to increase awareness of the census and its value to the community. Also recommended were the continued and extended use of nontraditional enumeration sites such as RV sites, parks, community centers, service organizations, and so on to provide mobile populations opportunities to participate in the census.⁶⁶

Ethnographic social network tracing of highly mobile people. To learn more about how residential mobility impacts census coverage and accuracy, researchers traced the social networks of six groups of highly mobile people using participant-observation methods. The groups participating in these studies included:

- Survival campers who lived out of their vehicles and tents and moved among campgrounds and public parking areas every few days or weeks.⁶⁷
- Seasonal workers who circulated among an average of three term-assignments at different distant work sites.⁶⁸
- A folkloric dance group made up of Mexican former farm workers and their families settling in the rural Midwest.⁶⁹
- Older Haitian seasonal agricultural workers in the South.⁷⁰
- Commercial fishermen on the Atlantic coast.⁷¹
- A local chapter of an American Indian men's society.⁷²

This observation period began before Census Day and lasted for 6 months. During this time, ethnographers identified and characterized participants and traced their moves among domiciles and sets of coresidents. Ethnographers reported which participants interacted with each other, noted the addresses, locations, and types of domiciles they occupied, and identified and characterized the participants' coresidents. Researchers located the domiciles reported in census geography and on the master address file, and they used person level address records collected at and near the domiciles where participants were traced in order to match records to participants or their reported coresidents.

⁶⁵ Jennifer Hunter, Manuel de la Puente, and Matt Salo, "Comparative Ethnographic Research on Mobile Populations: Final Report," Census 2000 Evaluation No. J.3, September 11, 2003, pp. iii–2.

⁶⁶ For more information on nontraditional enumeration sites, see Chapter 5, "Data Collection."

⁶⁷ P.A. Dee Southard, "Ethnographic Social Network Tracing among Non-recreational Homeless Campers in the Pacific Northwest," Census 2000 Ethnographic Evaluation Report 1, Final Report for Purchase Order Contract 43-YA-BC-030126 (June 2001).

⁶⁸ Nancy Murray, "Ethnographic Social Network Tracing among Young Adult Seasonal Workers," Census 2000 Ethnographic Evaluation Report 4, Final Report for Purchase Order Contract 43-YA-BC-032725 (June 2001).

⁶⁹ Alicia Chavira-Prado, "Ethnographic Social Network Tracing among Mexican Former Migrant Farm Workers in the Midwest," Census 2000 Ethnographic Evaluation Report 3, Final Report for Purchase Order Contract 43-YA-BC-030731 (June 2001).

⁷⁰ Louis H. Marcelin and Louise M. Marcelin, "Ethnographic Social Network Tracing among Haitian Migrant Farm Workers in South Florida," Census 2000 Ethnographic Evaluation Report 6, Final Report for Purchase Order Contract 43-YA-BC-033108 (September 2001).

⁷¹ Kathi R. Kitner, "Ethnographic Social Network Tracing among South Atlantic Commercial Fishermen," Census 2000 Ethnographic Evaluation Report 5, Final Report for Memorandum of Agreement 91-00-MOA-01 between the Census Bureau and National Marine Fisheries Service of the U.S. Department of Commerce (July 2001).

⁷² Brian Joseph Gilley, "Ethnographic Social Network Tracing among Native American Men in Oklahoma," Census 2000 Ethnographic Evaluation Report 2, Final Report for Purchase Order Contract 43YA-BC-031738 (June 2001).

These studies indicated that most of the habitually and residentially mobile social network participants who were found to be enumerated shared certain traits as well as a common social identity. Most had census residences in conventional housing. Most maintained ties with and repeatedly and routinely returned to the same set of residentially sedentary residents in one locality. Those who lacked any of these traits were more often omitted from the census. Of those omitted, a majority occupied a series of domiciles in transient quarters, commercial accommodations, and other domiciles that Census 2000 did not list as units of enumeration.⁷³

Based on these studies, researchers provided the following recommendations:

- Consider adapting census methods to more closely fit the cultural habits of distinct populations, including the traditionally, seasonally, and occupationally mobile.
- Design and test the feasibility of census operations appropriate for the contemporary patterns of mobility in the United States, including transnational migration.
- For the existing categories of census units of enumeration, continue to improve the master address file; the listing of housing units, group quarters, and service-based sites; and Census Bureau geographic programs and electronic maps.
- To include the uncovered transient quarters, work quarters, and types of residential accommodations that were unrecognized or excluded by definition as units of enumeration in Census 2000, develop and test more inclusive enumeration operations for types of domiciles that are often the default census residences of mobile people.
- Consider seasonal differences in the distribution of the population of the United States when estimating population, and consider developing the capacity to measure seasonal differences in the distribution of the population.

The enumeration of colonias in Census 2000: perspectives of ethnographers and census enumerators. Colonias are generally unincorporated subdivisions located along the border between the United States and Mexico. The settlements lack basic infrastructure and services and are home to low-income residents. Although these settlements have existed for decades, during the 1980s and 1990s, the low cost of land in colonias provided opportunities for home ownership and attracted many poor, border-city residents. This study examined how Census 2000 was conducted in selected colonias to determine what, if any, barriers to enumeration exist. For this study, the Census Bureau commissioned four ethnographic studies conducted in colonias located in Dona Ana County, NM (two sites), El Paso County, TX, and Riverside County, CA. These studies consisted of participant observation, interviews, and focus groups conducted by a team of ethnographers. In addition, personnel from the Statistical Research Division and the Planning, Research and Evaluation Division traveled to local census offices and conducted nine focus group studies with census enumerators, four with crew leaders and crew leader assistants, and two with cultural facilitators.

The findings of these studies indicate that four major barriers to enumeration in the colonias existed. These included irregular housing, limited formal education or knowledge of English, concerns about confidentiality, and complex or fluid households. While each presented obstacles in all colonias, the extent to which these barriers posed problems varied. To overcome these obstacles in future censuses and surveys, researchers suggested that the Census Bureau expand its outreach efforts through using promotional materials in Spanish and English, placing a greater emphasis on on-the-job training in the field, and in particular, employing Spanish-speaking enumerators and cultural facilitators familiar with these areas.⁷⁴

⁷³ Leslie A. Brownrigg, "Ethnographic Social Network Tracing of Highly Mobile People: Final Report," Census 2000 Evaluation No. J.2, October 16, 2003, p. iii–iv; Manuel de la Puente, *Census 2000 Ethnographic Studies*, Census 2000 Testing, Experimentation, and Evaluation Program, Topic Report No. 15, (Washington, DC: U.S. Census Bureau), pp. 20–21.

⁷⁴ Manuel de la Puente and David Stemper, "The Enumeration of Colonias in Census 2000: Perspectives of Ethnographers and Census Enumerators: Final Report," Census 2000 Evaluation No. J.4, September 22, 2003.

Category K: Data Capture

During Census 2000, the Data Capture System 2000 (DCS 2000) processed over 120 million census forms using optical mark recognition (OMR) and optical character recognition (OCR) to translate responses on questionnaire pages into digital images.⁷⁵ The Census Bureau conducted two evaluations to assess the performance of the DCS 2000, its components, and the data capture audit resolution (DCAR) process and to measure the impact of the data capture process on data quality.

One evaluation focused on DCAR, a three-phased process to review and correct, if necessary, OMR interpretations for status and population-count roster entries.⁷⁶ Of the 126,866,759 returns sent to DCAR, 124,194,637 (97.89 percent) passed the edit. Of the failed cases, 33.03 percent were processed for count check, and 66.97 percent for status review. The percent of returns sent to count check and status review increased for mail returns faster than for enumerator returns the further from Census Day the return was checked in. This indicated more consistent quality for enumerator returns over time. The evaluation found that DCAR corrected the data for a large number of cases that would have been included in coverage edit follow-up (CEFU) without the corrections made by the DCAR process.

The second evaluation considered how well the interpretation of census forms could be delegated to automated data capture and imaging technology. Both the evaluation and production automated technologies were prone to any one of the following errors: failure to read a field on the form, picking up content that was not really there (as in trying to interpret a stray mark), incorrectly capturing the content on the paper, or correctly capturing what the respondent wrote but not what the respondent intended. The standard for key-from-paper entry was to capture content with no more than a 2.0 percent error rate. Among other patterns, this evaluation noted the following:

- The performance of the automated technology depended on whether the character recognition algorithm determined the content was clear enough to process. If the automated technology determined the content of a write-in field was clear, it processed the content with a typical error rate of 1.0 to 1.1 percent. If the automated technology determined the content of a check-box field was clear, it processed the content with a typical error rate of 1.2 to 1.5 percent.
- If the automated technology rejected content as unclear, the typical error rate after remedial keying by human operators was 4.8 to 5.3 percent. This key-from-image mode tends to deal with content particularly hard for human or machine to interpret, and therefore the error rate is not necessarily a poor reflection on the automated technology or on the keyers.
- The most frequent causes for failing to capture the intended response were the respondent's extra entry in a check-box, missing a character, or entering a wrong character. The most common reasons found for these problems were poor handwriting, no reason found, or rules not followed.

Category L: Processing Systems

Once captured by the DCS 2000, census data continued through a series of processing steps that converted raw ASCII data into a standardized decennial response file (DRF), census unedited files, and ultimately the 100 percent census edited file and the sample census edited file. The agency completed five evaluations in this category. These evaluations examined a variety of postcensus processing activities used to prepare the data from the original responses for release of the official counts and tabulations.⁷⁷

⁷⁵ For more information on this topic, see Chapter 6, "Data Capture and Processing."

⁷⁶ The roster entries comprise the names of individuals in the housing unit. For more information on DCAR, see Chapter 6, "Data Capture and Processing."

⁷⁷ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, November 17, 2004, p. 25. For more information on the DRF, the PSA, and the HCUF, see Chapter 6, "Data Capture and Processing."

One evaluation examined the processes of linking returns and, from that, setting housing unit status and expected household size on the DRF. Linked returns were returns comprised of two or more forms. Of 129,389,529 returns, 1.07 percent were linked. Of these, 2.82 percent had three or more forms. Most linked returns included an enumerator first form and an enumerator continuation form. For returns that comprised two or more forms and were completed by the respondent, the number of valid person records and roster names corresponded to the reported household size. The evaluation recommended attempting to link only enumerator first and enumerator continuation forms to simplify the linking process and cause very little loss of data. It further recommended redesigning the interview summary section of the enumerator forms and using mobile computing devices to improve the consistency of responses.⁷⁸

Two evaluations of the primary selection algorithm (PSA) indicated that less than 10 percent of all Census IDs on the DRF were enumerated by more than one return. Most of these were enumerated by two returns. Households that the PSA verified as having two returns were most often formed by two enumerator returns or one mail return combined with one enumerator return. When two enumerator returns formed a PSA household, over 91 percent were the result of one return from NRFU and one return from CIFU. This was expected due to the design of the CIFU operation. Of the 8,716,359 Census IDs with two eligible returns, over 70 percent had a redundant return (a return containing only person level address records represented on the basic return of a PSA household). For those Census IDs with residents in two PSA households, the “best” household or a household which was identical in terms of net residents to the other household at the Census ID was selected about 80 percent of the time.⁷⁹

Another evaluation examined the processes for creating the 100 percent census unedited file (HCUF). The HCUF contained all the household and person records included in Census 2000. This file was used to determine which addresses were included in the census and to determine the count of persons at each address. Evaluators noted that nearly 128 million addresses were on the decennial master address file (DMAF) following the completion of various Census 2000 operations. Approximately 117.3 million were ultimately confirmed as housing unit addresses. Just over 9 million addresses on the DMAF were determined to be not valid addresses. Of the 117.3 million addresses resolved as housing unit addresses, 106.7 million were determined or imputed to be occupied, and the remaining 10.6 million were determined or imputed to be vacant. Approximately half a million addresses had their status resolved by imputation. There were 195,245 addresses determined to be valid census addresses whose occupancy status could not be determined; occupancy status had to be imputed as a result. There were 296,617 addresses whose validity as census addresses could not be determined. As a result, their validity and their occupancy status were both imputed. There were no enumeration data on the DRF or the DMAF for 251,477 (84.8 percent) of the addresses whose validity as census addresses could not be determined. Based on their review of the HCUF creation process, evaluators recommended using stronger processes for software quality assurance to ensure more complete adherence to specifications and improving the timing of census follow-up operations to ensure that addresses added by those operations are placed on the DMAF in time for the data to be included in the census.⁸⁰

Another evaluation focused on the “beta site.” As the software testing site for Census Bureau application developers, the beta site also served as an integration center for regional census center (RCC) and local census office (LCO) systems, a testing center for all systems, and a support center for RCC, LCO, and the National Processing Center systems. The beta site analysis included information on how successfully the data collection systems were integrated and the benefits of the software testing and release process. Evaluators noted that given the unprecedented reliance on automated systems during Census 2000, the beta site played an important role in the decennial census. They indicated that the underlying concept of the beta site and its role in software

⁷⁸ Miriam Rosenthal, “Operational Analysis of the Decennial Response File Linking and Setting of Housing Unit Status and Expected Household Size,” Census 2000 Evaluation L.2, June 30, 2003, pp. iv–3.

⁷⁹ Stephanie Baumgardner, “Analysis of the Primary Selection Algorithm, Final Report,” Census 2000 Evaluation No. L.3a, November 26, 2002, p. ii; and Stephanie Baumgardner, “Resolution of Multiple Census Returns Using a Re-interview, Final Report,” Census 2000 Evaluation No. L.3b, September 10, 2003, p. ii.

⁸⁰ Kim Jonas, “Census Unedited File Creation, Final Report,” Census 2000 Evaluation L.4, July 31, 2003, p. iii.

validation were generally viewed as beneficial. However, evaluators also recommended that processes and communications between the beta site and its customers be improved for the 2010 Census. Additionally, the evaluation recommended improving testers' knowledge about the purpose and capabilities of the software to be tested, as well as adopting the Capability Maturity Model for software development.⁸¹

Category M: Quality Assurance Evaluations

Census 2000 involved more than 20 major field operations and, at its peak, more than 500,000 temporary workers. Managing the quality of the deliverables produced by this large, decentralized, and transient workforce was a major challenge for the Census Bureau. Census 2000 continued the tradition, initiated in the 1960 census, of incorporating into field operations numerous quality assurance activities to minimize and prevent the clustering of significant performance errors and to promote continuous improvement. There were two evaluations for this category. The first reviewed the effectiveness of quality assurance (QA) programs, noting their strengths and deficiencies, and provided a critique of the Census Bureau's QA philosophy. This evaluation noted the following:

- Given the many developments, it is not surprising to find that the overall perception throughout the Census Bureau, and at all levels, is that the Census 2000 QA field program was an important element in preventing significant errors and in preventing the clustering of significant errors.
- Based on the evaluations and comments from those involved, many of the Census Bureau's early activities in preparing for Census 2000 are seen as having utilized a full QA approach that met the Census Bureau's stated goal of promoting timely and continuous improvement. However, in the context of what actually transpired during the data collection phase, the perception is less clear and decidedly mixed.
- A vital aspect of the QA program for promoting continuous improvement—real-time capture and dissemination of data during the data collection process, with which to monitor, evaluate, and react—was not implemented.

The second report evaluated the effectiveness of various variables in the administrative reinterview that was part of the nonresponse follow-up (NRFU) reinterview program. The Census 2000 NRFU reinterview program included three components: random reinterview, administrative reinterview, and supplemental reinterview. The purpose of the reinterview program was to identify faulty data collection, both intentional and unintentional. This report noted the following:

- Random reinterviews represented 93.09 percent of the cases selected for the reinterview program. The remainder of the reinterview cases were administrative and supplemental reinterviews (4.34 percent and 2.57 percent, respectively).
- Over the entire NRFU operation, 291,441 enumerators were identified as outliers based on a comparison of questionnaire characteristics of each enumerator against the average for their area. This was 62.57 percent of enumerators with completed work.
- Supplemental cases with complete reinterview information showed a higher frequency of enumerator error between the original enumeration and the reinterview (11.30 percent) than random and administrative cases (9.42 percent and 9.67 percent, respectively). This higher incidence of error identification shows the effectiveness of the supplemental reinterview component.
- Of the characteristics reviewed for the administrative sample, a high delete variable had the biggest impact for identifying enumerators with error.

⁸¹ Titan Systems Corporation/System Resources Division, "Operational Requirements Study: The Beta Site Systems Testing and Management Facility, Final Report," Census 2000 Evaluation L.5, January 14, 2003, pp. iii–vi.

Category N: Accuracy and Coverage Evaluation (A.C.E.) Survey Operations

For this category, the Census Bureau planned 21 evaluations designed to measure how well the agency carried out different components of the A.C.E. from an operational perspective. While some of these evaluations were canceled due to resource constraints or insufficient data, five were completed. Additionally, the balance of the planned evaluations were instead carried out as Executive Steering Committee for A.C.E. Policy (ESCAP) analysis reports. Following the ESCAP process, the Census Bureau conducted additional research and analysis of the A.C.E. operations and estimates. This additional work is known as ESCAP II. (See footnote 29 for additional information about ESCAP and ESCAP II.)

Category O: Coverage Evaluations of the Census and of the A.C.E. Survey

For this category, the Census Bureau planned 26 evaluations. Although nine were canceled and ten evaluations were halted and shifted to ESCAP reports, the agency published seven evaluations that focused on measures of coverage for the census counts and the A.C.E. estimates. These studies identified person characteristics and housing unit characteristics that were related to being missed or erroneously enumerated. Analyses in this area also studied the quality of data from proxy respondents and the frequency and patterns of geocoding error. Furthermore, census counts were compared to demographic analysis (DA) benchmarks to evaluate accuracy and completeness. This last evaluation of subnational DA benchmarks is summarized below.

Subsequent to the ESCAP II work, the Census Bureau embarked on additional research to further evaluate census coverage and evaluate and possibly revise the A.C.E. estimates. This research work, known as A.C.E. Revision II, is discussed in the “Coverage Measurement Programs” section of this chapter.

Examination of the consistency of census data with demographic benchmarks at the subnational level. The Census Bureau conducted numerous analyses relating to the measurement of net coverage in Census 2000 as part of the ESCAP and ESCAP II processes. As in the previous census, these analyses included use of demographic analysis (DA) national-level estimates to evaluate census net coverage by age, sex, and race groups and to assess the accuracy of coverage measurement survey estimates. Summaries of these analyses and their findings, as well as a basic description of the DA methodology, can be found in the “Demographic Analysis” section of this chapter. Other ESCAP-related analyses that the Census Bureau conducted are discussed in the “Accuracy and Coverage Evaluation” section.

The Census Bureau also used DA to provide independent housing benchmarks (based on administrative data on the housing stock) to assess the completeness of its address lists (the master address file [MAF]) and to evaluate national-level housing unit coverage in Census 2000. Additionally, the Census Bureau carried out a Census 2000 coverage evaluation (separate from the ESCAP processes) using subnational DA housing and demographic benchmarks; that evaluation is summarized here.⁸²

Before 1990, the use of DA estimates to evaluate the census was, for the most part, restricted to national-level estimates. However, the Census Bureau did conduct work with subnational DA estimates in conjunction with the 1990 and earlier censuses, and the analysis associated with the evaluation discussed here expanded upon the earlier work. In the current evaluation, researchers compared both subnational housing unit benchmarks and population demographic benchmarks with the associated Census 2000 data. Demographic housing unit benchmarks for groupings of counties within regions were the basis of comparison with census data for examining subnational differences in housing unit coverage.⁸³

⁸² Arjun L. Adlakha, J. Gregory Robinson, Kirsten K. West, and Antonio Bruce, “Assessment of Consistency of Census Data with Demographic Benchmarks at the Subnational Level,” Census 2000 Evaluation No. O.20, August 18, 2003.

⁸³ Subnational DA housing benchmarks were also used to evaluate housing unit coverage in the Census 2000 dress rehearsal (conducted in 1998) sites. The results of this analysis confirmed the need for the Census Bureau’s reengineering of the MAF building process for Census 2000. See U.S. Census Bureau, Census 2000 Dress Rehearsal Evaluation Summary, Planning, Research, and Evaluation Division, August 1999, pp. 7–8.

With regard to DA population benchmarks, three different types of DA administrative data were used to evaluate coverage of three age segments of the population, by region or groupings of counties: school enrollment data for 1990 and 2000 to provide an independent benchmark of the school-age population; Medicare data for 1990 and 2000 to produce an independent estimate of the population ages 65 and older; and intercensal birth data to provide an independent benchmark for the population of children ages 0 (less than a year) to 9.⁸⁴

In DA, the Census Bureau analyzed sex ratios⁸⁵ to evaluate the quality of census data on sex composition, as classified by age. For example, as is explained in the “Demographic Analysis” section of this chapter, the Census Bureau compared the sex ratios from the census data with “expected” sex ratios from DA for both the Black and non-Black adult populations to make inferences about differential coverage.

However, because DA cannot produce expected sex ratios for subnational areas (due to the lack of sufficiently accurate data on internal migration rates), the sex ratio analysis for this evaluation consisted of comparing census sex ratios for the Black and non-Black populations for regions of the country, and inferring, consistent with national-level findings, that, for the most part, differences in these ratios were the result of differential coverage.

The subnational DA benchmarks used to assess Census 2000 net coverage produced findings consistent with the national-level DA results and provided some geographic context for noted changes in net coverage as compared to 1990 as well as for differences between the Black and non-Black populations. For example, school enrollment ratios and Medicare enrollment ratios for 1990 and 2000 indicated that net coverage improved for these age groups from the 1990 census to the 2000 census and showed that the degree of improvement (defined as the percentage point change in the net undercount rate) was greatest for counties with higher concentrations of minorities and those designated as the most difficult-to-enumerate. These findings were consistent with national-level DA results that showed that improvement in net coverage from 1990 to 2000 was greater for Blacks than for non-Blacks.⁸⁶

Net coverage in the census improved for the population ages 0 to 9 from 1990 to 2000 for all regions, but the pattern of regional differences remained the same. Thus, the data revealed that the net undercount rate for this age group was below the national average in the Midwest and Northeast regions and above it in the South and West regions. The data also revealed that coverage improvement was greater for Black children than non-Black children in every region, resulting in a narrowing of coverage differentials between these two groups. However, net undercount rates remained higher for Black children in every region except the West, where a large proportion of non-Black children in this age group was Hispanic. The analysis indicated that Hispanic children had higher net undercount rates than non-Hispanic children—results which were consistent with other findings.⁸⁷

Finally, the census sex ratio analysis for all regions showed lower sex ratios for Blacks than non-Hispanic Whites. This was most likely attributable to the higher net undercount rates for Black men in all regions. Additionally, the Black/White sex ratio gap remained about the same as it was in 1990 across all regions, implying approximately equal improvements in coverage for Black adult males and females in Census 2000.⁸⁸

⁸⁴ “Assessment of Consistency of Census Data with Demographic Benchmarks at the Subnational Level,” pp. iii–iv. Some of these subnational DA demographic benchmark analyses and data are also contained in the ESCAP-related reports; see, for example, U.S. Census Bureau, J. Gregory Robinson, “Accuracy and Coverage Evaluation: Demographic Analysis Results,” DSSD Census 2000 Procedures and Operations Memorandum Series B-4*, March 12, 2001, Table 9.

⁸⁵ The sex ratio is defined as the ratio of the number of males per 100 females.

⁸⁶ “Assessment of Consistency of Census Data with Demographic Benchmarks at the Subnational Level,” p. iv.

⁸⁷ *Ibid.*, pp. iv–v.

⁸⁸ *Ibid.*, p. 30.

The evaluation recommended:

- The use of subnational DA benchmarks as a tool to evaluate decennial census data be continued and expanded. Specifically, the report recommended that subnational DA benchmark estimates be used to formally evaluate the 2010 Census and that DA research and development activity be undertaken to expand the coverage assessment to the individual state or county level.
- Housing benchmark analysis be incorporated with other evaluations of the master address file that are implemented throughout the decade.
- The use of demographic benchmark analysis (along with other measures) in evaluating coverage in census tests.⁸⁹

Category P: A.C.E. Statistical Survey Design and Estimation

The evaluations in this category were designed to examine the quality of the A.C.E. estimates. The analyses underlying these evaluations were instead conducted as part of the ESCAP process. As noted above, the Census Bureau followed up the initial ESCAP examination of the quality of the A.C.E. estimates with the ESCAP II and A.C.E. Revision II work.

Category Q: Organization, Budget, and Management Information System

In March 2001, the Census Bureau retained IBM Business Consulting Services to conduct an evaluation of the management structure, processes, and tools for Census 2000. According to the study plan provided by the agency's Decennial Management Division, the contractor evaluated seven areas: the management model for Census 2000, organizational structures and processes, decision-making processes, management information tools, staffing, external influences, and the use of contracts.⁹⁰ Using interviews with Census Bureau personnel and qualitative analyses of the interview data, this evaluation assessed the impact of the political environment, the internal census environment, and changes in the management model on decennial activities.

Evaluators noted the following conclusions:

- Key performance indicators revealed that, in certain respects, Census 2000 was the most successful U.S. decennial census ever conducted. In Census 2000, the net undercount estimate of the household population was minus 0.49, meaning that there was a small estimated overcount. Achievement of a small net coverage error that is close to zero is an important success factor.
- The national response rate that determined the Census 2000 NRFU workload was 65 percent, which matched the 65 percent response rate from the 1990 census; this indicated that the Census Bureau had stemmed the decline in response that had been the trend over recent decades.
- The NRFU effort was completed ahead of schedule.
- Post 1998, the Census Bureau operated within an organization that was well structured to support its performance objectives. The decennial organization was organized by a business process that drew from functional capabilities residing within the participating divisions as required. In many of the substructures and teams within the decennial organization, however, the leaders of the teams and decision-making bodies were not given or did not choose to exercise true decision-making authority. Although the intent behind the creation of these organizational bodies was to push decision-making to the lowest management levels technically possible, there was no decision-making authority in place at these lower levels to support that intent.

⁸⁹ Ibid., p. v.

⁹⁰ U.S. Census Bureau, Census 2000 Study Plan for Evaluation Q.1—Evaluation of the Management Processes and Systems of the 2000 Decennial Census (undated).

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- A knowledge-management capability to retain corporate knowledge, to support responses to external reporting requirements, and to communicate programmatic changes to decennial census participants in a timely manner would assist in improving communications and in stabilizing and maintaining the decennial census knowledge base throughout the decade.

Category R: Automation of Census Processes

In June 2000, the Census Bureau commissioned Titan Systems Corporation to conduct evaluations of 12 systems used during Census 2000. These systems facilitated activities for data collection and capture, cost and progress reporting, management controls, customer reaction, quality assurance and analysis, the Internet, and more. The evaluations focused on the effectiveness of methodologies, employed during the planning stages, that were used to determine system requirements and their impact on overall system functionality. Using information drawn from interviews with both Census Bureau staff and contractors involved with the planning, development, operation, and management of Census 2000 systems, the contractor assessed whether the correct requirements and proper functionality were specified and whether the systems performed adequately in terms of either impact on data quality or in providing useful management information. The contractor also assessed contract management issues and the effectiveness of the Census Bureau's contract management practices.

In its evaluations of systems for Telephone Questionnaire Assistance; coverage edit follow-up; Internet Questionnaire Assistance; Internet Data Collection; laptop computers for A.C.E.; American FactFinder; Operations Control System 2000 (OCS 2000); matching and review coding system for A.C.E.; A.C.E 2000 control system; Pre-Appointment Management System/Automated Decennial Administrative Management System (PAMS/ADAMS); Management Information System 2000; and Data Capture System 2000, the contractors noted the following:

- **Process improvement recommendations:** From a systemic perspective, certain supporting processes and methodologies should be in place to provide a sound framework for system development activities. The absence of such a framework permits development on an ad hoc, rather than a structured basis, and usually leads to poor planning and inefficient use of resources. The evaluation reports presented recommendations to improve internal processes so that systems can be designed, developed, and managed using a disciplined approach.
- **Requirements definition issues:** Because the phase in which requirements are defined is critically important, it should be performed in accordance with an agency-approved methodology or set of guidelines that prescribe the steps inherent in the process. These guidelines need not be inflexible; they can be written to allow for various circumstances and constraints, but should, in any case, identify all requirements issues that can impact system functionality. The evaluation reports presented suggestions on ways to improve the requirements definition function.
- **Outsourcing and contract management:** Due to the Census Bureau's long-standing reliance on in-house resources for programming support, Census Bureau staff were not sufficiently prepared to make the transition to outsourcing. This policy shift required that Census Bureau personnel who either managed, or were working closely with, contractors have a basic understanding of contracting principles and an awareness of the legal/contractual issues inherent in the statement of work. Given that information technology contracts are typically far more complex than other types of contracts, the potential for misinterpretations in the scope of work and content of deliverables could easily have given rise to contract disputes and performance problems. Fortunately, the Census Bureau succeeded in avoiding many problems by awarding contracts to many qualified vendors. The automated systems evaluations included findings that can help the Census Bureau to better manage the risks associated with outsourcing in the future.

Despite these considerable managerial, technical, and contractual challenges, however, the Census Bureau successfully deployed all of the decennial systems for Census 2000. Evaluators and interviewees attributed such successes to the use of some highly effective techniques. These evaluations identify those “best practices” viewed by participants as the most beneficial in terms of their contributions to the success of Census 2000 systems.⁹¹

COVERAGE MEASUREMENT PROGRAMS

The undercount has been a significant issue in census-taking since the first census in 1790. Both President Washington and Secretary of State Jefferson thought that the 1790 census total population—reported as 3.9 million—should have been over 4 million.⁹² Crude historical estimates of percentage net undercount date back as far as 1880.⁹³ Beginning in the 1940s, the Census Bureau produced demographic-based estimates of census net undercount, focusing on specific demographic subgroups.⁹⁴ By the 1960s, the Census Bureau had increasing evidence that African Americans and other minorities were undercounted at higher-than-average rates. Evaluations of the census since that time have indicated that this “differential undercount” also affects young adult males and renters. By the late 1970s, the Census Bureau had done significant work in developing survey-based tools for estimating net coverage in the census, and during the 1980s, it significantly refined these tools for measuring the number of people missed by the census for relatively large areas and groups. For 1990, the Census Bureau employed the first true “coverage measurement survey” to measure net overcounts and undercounts in the census; it was referred to as the 1990 post-enumeration survey.⁹⁵

Today, the Census Bureau employs two principal methods—both of which have been vastly improved since their earliest uses—to evaluate coverage in the census. That is, the agency compares the census counts to two sets of estimates of net undercount: (1) estimates produced by the methodology known as demographic analysis and (2) estimates produced through dual system estimation in conjunction with a coverage measurement survey. In Census 2000, the coverage measurement survey was called the Accuracy and Coverage Evaluation.

Accuracy and Coverage Evaluation (A.C.E.)

Introduction. The Census Bureau designed the A.C.E. program to measure net coverage errors in Census 2000 and to potentially carry out a statistical adjustment of the Census 2000 data for nonapportionment purposes, based on the results of the A.C.E. sample survey. Earlier legal challenges to the Census Bureau’s planned uses of sampling in Census 2000 resulted in a 1999 Supreme Court decision (*Department of Commerce v. U.S. House of Representatives*); this ruling states that Section 195 of Title 13, U.S. Code (Title 13 provides the statutory authority for conducting the census) precludes the use of statistical sampling (including statistical adjustment based on sampling) to produce congressional apportionment numbers. As a result of the Supreme Court ruling that sampling could not be used for apportionment purposes and the Clinton administration’s interpretation of the decision as affirming the legality of using statistical sampling for purposes other than apportionment, including redistricting, if doing so were determined to be “feasible,”⁹⁶ the Census Bureau proceeded with plans to produce a statistically adjusted census count for redistricting and other nonapportionment purposes.

Thus, as discussed in this section and elsewhere (see “The Debate Over the Use of Sampling” section of Chapter 11, “Legal Issues”), the Census Bureau and the Commerce Department made a

⁹¹ Florence H. Abramson, *Census 2000 Testing, Experimentation, and Evaluation Program Summary Results*, November 17, 2004, pp. 31–32.

⁹² U.S. Census Bureau, *Census and You*, Volume 25, No. 8, August 1990, p. 2.

⁹³ J. Gregory Robinson and Kirsten K. West, “Demographic Analysis” in *Encyclopedia of the Census*, Margo J. Anderson, Editor-in-Chief (Washington DC: Congressional Quarterly Press, 2000), p. 166.

⁹⁴ *Ibid.*

⁹⁵ For more information about the 1990 census PES, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: U.S. Government Printing Office, March 1996), pp. 11-19–11-36. For information about litigation over statistical adjustment of the 1990 census based on the results of the PES, see the “1990 Litigation” section of Chapter 11 of the *Census 2000 History*.

⁹⁶ This is the term used in Section 195 of Title 13, United States Code.

series of decisions regarding the possible use of the A.C.E. results in producing the redistricting and long-form (sample) data products, intercensal estimates, and survey controls. As a result of these decisions, the Census Bureau used unadjusted Census 2000 data for all such purposes.⁹⁷

Overview of A.C.E. design/methodology. The Census 2000 A.C.E. program involved comparing survey results to the census itself, using a methodology known as dual system estimation (DSE), to measure net overcounts and undercounts in the census—and was similar to both the 1990 census post-enumeration survey (PES) and the 1980 census Post-Enumeration Program in that regard.⁹⁸ This methodology required two independent systems of measurement: the population sample (P-sample) and the enumeration sample (E-sample). The P-sample measured the housing unit population, as did the census, but was conducted independently of the census. This was done by selecting a sample of block clusters (geographically contiguous groups of blocks), canvassing each block cluster to find all housing units, and interviewing the people in the listed housing units. Results of the P-sample were matched to census enumerations to determine the non-match rate in the P-sample and to indicate potential omissions (people who were missed) in the census. The E-sample, which consisted of the census enumerations in the same sample block clusters as the P-sample, was used to measure the erroneous enumeration rate in the census. Erroneous enumerations included duplicate enumerations, people who were counted at the wrong address, and fictitious people. Thus, the E-sample was the basis for measuring the correct enumeration rate, and the P-sample was the basis for measuring the match rate.

These overlapping samples reduced both the variance of the dual system estimator and the level of field activities required, as well as their cost, and resulted in efficient data processing. The two samples produced an estimate of the true population that was used to estimate net coverage error.

First-phase sampling. At the time of the January 1999 Supreme Court decision prohibiting the use of sampling for apportionment, the Census Bureau was already planning the first phases for identifying the sample to be used in the Integrated Coverage Measurement (ICM) program. As part of the original Census 2000 plan unveiled in February 1996, the ICM was one of several planned uses of sampling that the Census Bureau believed would, taken together, increase the accuracy and decrease the cost of the census.⁹⁹ The goal of the ICM was to produce a “one-number census” that corrected for net coverage errors. That is, unlike the 1990 census, when adjusted data were produced after delivery of the apportionment and redistricting data, results from the ICM coverage measurement survey would be “integrated” into the census to produce estimates that were to serve as the official decennial census data for all purposes, including apportionment.¹⁰⁰ Consequently, the ICM was designed to produce reliable estimates of coverage of each state’s total population, and this required a very large sample; the Census Bureau had planned a 750,000 housing-unit sample.

As discussed earlier, following the Supreme Court ruling, the Census Bureau proceeded with plans to produce statistically adjusted data for purposes other than apportionment. Thus, the goal of

⁹⁷ U.S. Census Bureau, *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, DSSD/03-DM, issued September 2004, is a one-volume publication that provides a comprehensive overview of: the design and methodology of the A.C.E.; analyses and evaluations of its results; and subsequent research to produce revised estimates and of assessments of those data (known as A.C.E. Revision II). Descriptions of the A.C.E. and A.C.E. Revision II methodologies presented here include information summarized from this document. A PDF version of the document is available on the Census Bureau’s Web site at <<http://www.census.gov/dmd/www/refroom.html>>. Additionally, this Web page provides access to a wealth of information regarding the A.C.E., including documents relating to the decisions about the possible use of the initial A.C.E. estimates and the A.C.E. Revision II estimates.

⁹⁸ For information about the 1990 PES, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: U.S. Government Printing Office, March 1996), pp. 11-19–11-36. For information about the 1980 PEP, see U.S. Census Bureau, *1980 Census of Population and Housing, History, Part E*, PHC80-R-2E (Washington, DC: U.S. Government Printing Office, August 1989), pp. 9-8–9-11.

⁹⁹ For a discussion of the other planned uses of sampling and the changes to the operational plans for Census 2000 brought about by the Supreme Court ruling, see the “Debate Over the Use of Sampling” section of Chapter 11.

¹⁰⁰ See the 1995 Census Test and Census 2000 Dress Rehearsal sections of Chapter 2, “Planning the Census,” for more information about the ICM program.

the “new” Census 2000 coverage measurement survey (the A.C.E.) was to measure census coverage (and correct for measured net coverage errors) for national and subnational population domains having different census coverage properties. The Census Bureau believed it could produce estimates for these domains with sufficient precision with a sample of about 300,000 housing units.¹⁰¹

The Census Bureau determined that it was more efficient, particularly from a software quality perspective, to select the A.C.E. sample by subsampling the completed ICM sample. Thus, the entire ICM sample was selected as originally planned and refined through various steps to yield the A.C.E. housing-unit sample. Specifically, the A.C.E. sample design was derived from the ICM design using a double-sampling approach.¹⁰²

The A.C.E. primary sampling unit was the block cluster, a group of one or more geographically contiguous census blocks, with a target size of about 30 housing units, although block clusters varied in size. Block clusters were stratified within each state using a preliminary census address list, according to the following categories:

- Small (0 to 2 housing units).
- Medium (3 to 79 housing units).
- Large (80 or more housing units).

The Census Bureau created a separate sampling stratum in states with American Indian reservations. Within each sampling stratum, the Census Bureau selected an equal probability systematic sample of block clusters. This phase of sampling yielded 29,136 block clusters with an estimated 2 million housing units in the 50 states and the District of Columbia.

Field staff canvassed the sample block clusters and created an independent address list of all housing units, including those at special places. The goal of this operation was to create an independent address frame of all housing units in the sample block clusters likely to exist on Census Day, April 1, 2000. Potential housing unit structures were included on the independent address list. During housing unit follow-up, field staff visited these structures to confirm that they contained housing units on Census Day.

Second-phase sampling. In the second phase, the Census Bureau selected block clusters from the first phase to be the final A.C.E. sample areas. Reducing the first-phase sample prior to performing the housing unit matching and field follow-up operations was important because of the labor-intensive nature of those operations. The principal steps/considerations in the second-phase sampling can be summarized as follows:

- The computer programs stratified block clusters using two housing unit counts: (1) a count from the independent listing operation and (2) a count from the DMAF updated as of January 2000.
- The Census Bureau retained all first-phase clusters from the American Indian reservation stratum in the second-phase sample.
- For the medium and large cluster strata, the Census Bureau allocated the national sample roughly in proportion to state population, with some additional sample allotted for the smaller states. Differential sampling was employed within states in order to (1) provide sufficient sample to support reliable estimates for several subpopulations and (2) control the variance by assigning a higher probability of selection to clusters with the potential for high omission or erroneous enumeration rates as identified by inconsistent housing unit counts between the independent list and the updated DMAF for the cluster.

¹⁰¹ Estimates of net coverage error were not produced for persons living in group quarters or in remote areas of Alaska. A separate sample was selected in Puerto Rico; the results were subject to higher than expected variances and are not discussed here.

¹⁰² The specifics of this methodology are described in U.S. Census Bureau, *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section I, pp. 3-9–3-16.

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- For the small cluster stratum, one goal was to avoid having small clusters with overall probability of selection much lower than the probability of selection of other clusters in the sample. A second goal was to have higher probabilities of selection for small clusters in which the number of housing units found in the independent listing process or in the updated DMAF was greater than the 0 to 2 housing units indicated in the initial census listing.

The second-phase sample contained 11,303 block clusters for the 50 states and the District of Columbia.

Census Bureau staff computer-matched the housing units on the updated DMAF of January 2000 to the A.C.E. independent address list, and using maps and other supplemental materials, they conducted a clerical review of the results to find additional matches. They also conducted a clerical search—limited to the block cluster—for duplicate housing units in both the A.C.E. and census lists. Finally, the Census Bureau carried out a field operation to clarify discrepancies.

Targeted extended search (TES) sampling. In the 1990 census PES, the Census Bureau reduced the effect of geocoding (placing a housing unit in its correct census block) errors by expanding the search for matches and correct enumerations to include not only the block cluster, but the surrounding ring of blocks, and even further in rural areas, where geocoding is more difficult. The Census Bureau defined the search area as the sample block clusters and the surrounding blocks. Thus, a P-sample person was considered a match if the corresponding census enumeration was found anywhere in the search area. Similarly, an E-sample person was considered a correct enumeration if he/she was determined to have been a Census Day resident anywhere in the search area. In theory, these two operations balance in the surrounding blocks and should increase the correct enumeration and match rates by the same amount, with little effect on the estimates but with potentially significant variance reduction. Because geocoding problems tend to be clustered, the matching staff in 1990 found the surrounding block search to be both fruitless and tedious for most block clusters. Thus, for the A.C.E., the Census Bureau decided to limit the surrounding block search to only those block clusters most likely to yield results. The TES did not change the A.C.E. block cluster sample, but it eliminated the surrounding block search for those block clusters not expected to have missing housing units or geocoding problems. This revision was designed to allow the analysts to concentrate their review on the block clusters that did have these types of units.

The Census Bureau implemented the TES in a subset of A.C.E. block clusters selected through a combination of certainty and probability sampling. Computer systems used the initial housing unit matching results to identify the A.C.E. housing unit nonmatches and potential census housing unit geocoding errors. Clusters with many potential A.C.E. housing unit nonmatches or census geocoding errors were selected with certainty; those that appeared to have fewer such problems were selected by a probability sample. Clusters without potential A.C.E. housing unit nonmatches or census geocoding errors were out of scope for the targeted extended search sampling.¹⁰³

Subsampling within large block clusters. The Census Bureau used subsampling in large block clusters for the final selection of housing units to be included in the P-sample. The objective was to reduce costs and yield manageable field workloads without significantly reducing the precision of the A.C.E. by taking advantage of the high intraclass correlation expected in large block clusters. That is, the selected portion of a large block cluster provided good representation of the portion not selected, so it was more efficient to include only a portion of the large block clusters, which allowed for a larger and more geographically diverse sample of clusters. The large block clusters had a higher initial probability of selection than medium block clusters, so this reduction in sample size, which was prespecified, affected the precision of the A.C.E. estimates only minimally. Subsampling of housing units within large clusters brought the overall probability of selection of these housing units in line with housing units in the medium-size clusters. Block clusters with 80 or more confirmed A.C.E. housing units, based on the initial housing unit match, were eligible for this subsampling. Within each block cluster, the Census Bureau formed segments with

¹⁰³ For additional information on TES sampling, see *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section II, pp. 4-12–4-14.

roughly equal numbers of housing units; these were designed to provide compact interviewing workloads and to facilitate the identification of an overlapping E-sample. Systems staff then selected one or more segments from each cluster for A.C.E. person interviewing. The A.C.E. housing units retained after all of the subsampling made up the P-sample. After the Census Bureau completed the reduction of housing units within large block clusters, the A.C.E. interview sample size for the 50 states and the District of Columbia was approximately 300,000 housing units.

The E-sample consisted of the census enumerations in the same sample areas as the P-sample, excluding census persons who were not data-defined and person records that were temporarily removed from the census because they might be duplicates. To be a census data-defined person, the person record needed to have responses to at least two 100 percent (so called because these questionnaire items are asked of all respondents and at all housing units) data items. The E-sample consisted of approximately 713,000 persons in 311,000 census housing units for the 50 states and the District of Columbia.

A.C.E. person operations. The Census Bureau conducted the A.C.E. person interview using a computer-assisted personal interview (CAPI) instrument.¹⁰⁴ Staff began the process by conducting telephone interviews with households for which the census questionnaire responses had been data-captured and included a telephone number. To minimize contamination (the circumstance where response, or lack thereof, to one interview is affected by the other) between the census interview and the coverage measurement survey interview, field staff conducted the remaining interviews in person only after completion of almost all census field operations in a given area. The Census Bureau conducted some nonresponse conversion¹⁰⁵ interviews and some interviews in gated communities or secured buildings by telephone. If an interview with a household member could not be obtained during the first 3 weeks of interviewing, staff attempted a “proxy” interview with a nonhousehold member. During the last 2 weeks of interviewing, the Census Bureau used the best interviewers available during the nonresponse conversion operation.

The Census Bureau established rules for determining those person records from both the P- and E-samples with sufficient information for matching. Acceptable person records required a complete name and two other characteristics. The Census Bureau coded persons in the E-sample with less information as “insufficient information for matching” and treated them as erroneous enumerations in estimation. The Census Bureau removed from the P-sample those person records with less than the required amount of information.

Staff then matched all P-sample persons who lived in a sample housing unit on Census Day to the people enumerated in the census anywhere in the block cluster. This matching was a computer operation with clerical review. Analysts used variables such as name, address, date of birth, age, sex, race, Hispanic origin, and relationship to householder to identify matches between the P-sample and census enumerations.

Search areas for qualifying TES cases included the ring of blocks beyond the sample block cluster. In the absence of contradictory information, a match constituted evidence that the P-sample person was a Census Day resident of the block cluster. Similarly, census persons in the E-sample who matched P-sample persons in the block cluster were considered to be correctly enumerated. The Census Bureau identified duplicates in both the P- and E-samples.

The person follow-up interview, using a paper questionnaire, collected additional information that was sometimes necessary for the accurate coding of the residence status of the nonmatched P-sample people and the enumeration status of the nonmatched E-sample people. The goal of this operation was to determine whether P-sample nonmatches actually lived in the sample block cluster on Census Day. Field staff interviewed persons in cases of possible matches to resolve their match status. Other cases sent to follow-up included matched people with unresolved residence

¹⁰⁴ For information on A.C.E. automation, see Chapter 6, “Data Capture and Processing” and Titan Systems Corporation, *Census 2000 Evaluation R.2.b: Laptop Computers for Accuracy and Coverage Evaluation, System Requirements Study, Final Report*, December 9, 2002.

¹⁰⁵ In the nonresponse conversion operation, all A.C.E. person interviewing cases were brought in from the field at a specified cutoff date. The operation was a last attempt to convert refusals to responses.

status and other types of cases considered to have the potential for geocoding errors in the P-sample. Interviewers gathered information that permitted each person to be coded as a nonresident, or as a nonmatched or matched resident of the block cluster on Census Day. Similarly, the Census Bureau conducted follow-up interviews in E-sample nonmatch cases to determine whether the persons were correctly or erroneously enumerated in the block cluster.

For TES blocks, analysts coded people who were enumerated in the sample block cluster but who lived in the ring of blocks surrounding the block cluster as correctly enumerated. The Census Bureau placed considerable emphasis on obtaining a knowledgeable respondent for the person follow-up interview. After field staff completed the follow-up interview, clerical analysts reviewed the results and assigned final status to these cases, assisted by an automated system.

Because the Census Bureau used the results of the matching operation in the estimation phase of the A.C.E., staff had to determine the match, the correct enumeration, and the residence status of all sample cases. When these could not be resolved through computer and clerical matching or through field follow-up interviews, the Census Bureau imputed the match, correct enumeration, or residence probabilities based on the distribution of outcomes of the resolved follow-up interviews.

Additionally, as in the census, some respondents did not answer all the questions in the A.C.E. interview. The Census Bureau imputed answers to unanswered questions in the E-sample as part of the census processing. For P-sample individuals, if the tenure (whether the person rents or owns the housing unit in which he/she resides), sex, race, Hispanic origin, or age responses were left blank, the Census Bureau imputed the missing information based on the distribution of the variable within the household or the overall distribution of the variable or by using hot-deck methods, depending on the variable. Finally, staff implemented a noninterview adjustment for P-sample housing units to account for the weights of households that should have been interviewed in the A.C.E. but were not.

Housing unit duplication. Preliminary analysis during the summer of 2000 indicated the possibility of a significant duplication of housing units in the DMAF.¹⁰⁶ While investigating the problem, the Census Bureau identified and flagged these census housing units and their occupants as potential duplicates. The Census Bureau reinstated those determined to be legitimate housing units for the final census counts of both housing units and people. Because the Census Bureau was unsure which housing units would be permanently deleted and which reinstated, these housing units and their occupants were not included in the housing unit or person E-samples. For coverage estimation, the Census Bureau treated both the housing units and the persons as non-data-defined and did not allow for the matching of P-sample housing units or persons to them. These cases are referred to as “late adds” or “temporarily removed from the census.” (See the section below entitled “Late Adds and Whole Person Imputations” for a brief discussion of the effect of late adds on the A.C.E. estimates.)

A.C.E. estimation. The A.C.E. used dual system estimation to estimate the net coverage error of the household population included in the census. The term “dual system estimation” signifies that data from two independent systems are combined to measure the same population. The dual system estimator assumes that all people have the same probability of being captured in the census and the same probability of being captured in the P-sample, but these two probabilities need not be the same. This assumption, designed and appropriate for capture-recapture fixed wildlife population studies, is obviously an oversimplification for the U.S. population as a whole and would result in a downward bias. Because dual system estimation only assumes equal capture probabilities within any group for which estimates are made, the Census Bureau uses what is called “post-stratification” to group together individuals—based on certain characteristics or variables—with similar probabilities of being included in the census (or similar coverage probabilities). Thus, separate estimates are produced for each of these groupings or post-strata. For the

¹⁰⁶ The Housing Unit Unduplication Program is discussed in more detail in the “Headquarters Processing” section of Chapter 6, “Data Capture and Processing.” In that discussion, it is referred to as the “Duplicate Delete Operation.”

Census 2000 A.C.E., the post-strata were defined by the following variables: race/Hispanic origin domain, age/sex, tenure, census region, metropolitan statistical area (MSA) size/type of enumeration area, and census return rate.¹⁰⁷

A complete cross-classification of these variables would have increased the variances of the estimates due to small expected sample sizes in many of the post-strata. Consequently, many detailed cells for the smaller race/ethnicity groups were combined; thus a total of 448 potential post-strata were formed. Once the Census Bureau obtained actual observed sample sizes and coefficients of variation, analysts further collapsed these to 416 post-strata.

Matching the P-sample to the census, the Census Bureau used the P-sample to measure the post-stratum level match or included-in-the-census rate for those P-sample persons determined to have been Census Day residents during the A.C.E. interview. Nonresidents were effectively dropped from the P-sample. The Census Bureau calculated a post-stratum level data-defined rate to account for those person records with limited information in the census and thus excluded from the E-sample and used the E-sample to measure the post-stratum level correct enumeration rate.

The dual system estimate. The dual system estimate for a post-stratum is defined as the census count multiplied by the data-defined rate multiplied by the following term: the correct enumeration rate divided by the match rate. This can be represented by:

$$\text{DSE} = \text{Census} \times \text{Rate}_{\text{DD}} \times \frac{\text{Rate}_{\text{CE}}}{\text{Rate}_{\text{Match}}} = \text{Census} \times \frac{\text{DD}}{\text{Census}} \times \frac{\text{CE}}{\text{E}} \times \frac{\text{P}}{\text{M}}$$

Because of the complexities of the A.C.E. design, the Census Bureau could not always use the simplest formulation of these quantities. In particular, the agency developed special procedures for people who moved between Census Day and the time of the A.C.E. interview. People who moved into the sample blocks were relatively easy to capture in the P-sample, but it was hard to match them to the census at their reported previous addresses. People who moved out of the sample blocks between the census and the A.C.E. interview were more difficult to find in the A.C.E., but it was relatively easy to determine whether the ones who were found were counted in the census. Therefore, the primary dual system estimator (DSE-C) used the estimated number of in-movers as an estimate of the number of movers and the estimated match rate for out-movers as an estimate of the match rate for movers. For small post-strata, specifically if there were fewer than ten out-movers in the A.C.E. sample, DSE-C could give anomalous results, and therefore the Census Bureau replaced it with DSE-A, which used only out-mover data.¹⁰⁸

Synthetic estimation for small areas. The Census Bureau designed the A.C.E. to serve two primary purposes:

- To provide information on net coverage error in the census, particularly differential coverage (that is, differences in net coverage between minorities and nonminorities, young adult males and other age/sex groups, and renters versus owners).
- To potentially adjust the census for such error for nonapportionment uses of the data, if deemed appropriate.

The sample sizes used in the A.C.E. provided adequate reliability for such estimates for the United States as a whole. However, they were too small to provide reliable direct estimates for most states, counties, and cities, and other governmental entities from townships to school districts that make use of census data. As a result, model-based (or synthetic) estimation was used for these areas.

The Census Bureau obtained a coverage correction factor for each post-stratum by dividing the dual system estimate by the census count of persons in housing units. Because the A.C.E. excluded people in group quarters or in remote Alaska, these people had an effective coverage

¹⁰⁷ For more information on the Census 2000 A.C.E. post-stratification design, see *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section I, pp. 7-5–7-13.

¹⁰⁸ For more information on the procedures for the treatment of movers, see *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section I, pp. 7-4–7-5, and 7-19.

correction factor of 1.00. The Census Bureau calculated a synthetic estimate for any area or population subgroup *b* by summing up for the relevant post-strata in the area or group the product of the coverage correction factor by the census count. Coverage correction factors for population groups with good coverage were close to 1.00. Population groups with poor coverage had coverage correction factors higher than 1.00, while coverage correction factors less than 1.00 in a post-stratum occurred when overcounts or erroneous enumerations in the census exceeded undercounts.

Measures of accuracy in the A.C.E. The Census Bureau estimated standard errors for the A.C.E. estimates by a stratified “jackknife” procedure. This procedure removed the 29,136 original block clusters one at a time and recalculated all weights and estimates in order to replicate the sample design with the slightly smaller sample. The Census Bureau then applied a standard variance formula to these replicated estimates. Staff also estimated a variance-covariance matrix for the coverage correction factors that could be applied to obtain standard error estimates for any aggregated estimate for a geographic area. These variance estimates did not reflect synthetic estimation error or other small area effects.¹⁰⁹

Housing unit dual system estimates. The Census Bureau also calculated dual system estimates for housing units using 98 post-strata defined by occupancy status, race of householder, size of building, and size of MSA/type of enumeration area. P-sample housing unit records were classified as actual housing units or not and then as matched or not. E-sample housing units were classified as correctly enumerated or not. Because data-defined records and movers were not considerations in housing unit estimation, the dual system estimate for each post-stratum was simply the census count—with an adjustment for units temporarily removed—multiplied by the following term: the correct enumeration rate divided by the match rate.

Initial results and evaluation of the A.C.E.—March 2001 redistricting data adjustment decision. Census 2000 adjusted block-level data had been prepared in the event the secretary of commerce decided in favor of using adjusted data as the official redistricting data. These data were available for release to states and localities by the deadline stipulated in Public Law 94-171 (within 1 year following the decennial census date). The Executive Steering Committee for Accuracy and Coverage Evaluation Policy (ESCAP), a committee of senior Census Bureau officials, provided a recommendation to the Census Bureau Director regarding whether the official redistricting data should incorporate a statistical adjustment; the committee recommended that the unadjusted census data be released as the official redistricting data.¹¹⁰ Based on the ESCAP report, the Acting Director of the Census Bureau informed the Secretary that he concurred with and adopted the ESCAP’s recommendation.¹¹¹ On March 6, 2001, the Secretary of Commerce announced that he had accepted the recommendation of both the Acting Director and the ESCAP and had decided that the unadjusted data would be released as the official redistricting data.¹¹²

The ESCAP noted that, given the information available at the time, its recommendation was not based on any clear evidence that the unadjusted census counts were more accurate, but rather on its concern that there was some yet undiscovered error in the A.C.E. estimates. The committee was most concerned about the inconsistency between the A.C.E. estimates and estimates from demographic analysis (DA), especially for particular population groups.¹¹³ It also noted concerns with synthetic and balancing error (these are discussed below) that required further investigation.¹¹⁴

¹⁰⁹ For detailed information on the methodology for computing standard errors for the A.C.E. estimates, see *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section I, pp. 7-14–7-16.

¹¹⁰ *Federal Register*, Vol. 66, No. 46 (March 8, 2001), pp. 14004–46.

¹¹¹ *Ibid.*, p. 14004.

¹¹² The Secretary’s decision is documented in *Federal Register*, Vol. 66, No. 49 (March 13, 2001), pp. 14520–21.

¹¹³ *Federal Register*, Vol. 66, No. 46, p. 14005. DA, which is discussed in the next section of this chapter, is a statistical technique that measures coverage trends as well as differences in coverage by age, sex, and race. DA uses records or estimates of births, deaths, immigration, emigration, and Medicare enrollments, and the results of the current and previous censuses, to develop estimates of the population at the national level.

¹¹⁴ *Ibid.*

Nineteen analysis reports were produced to inform the ESCAP's recommendation.¹¹⁵ The ESCAP, in its March 1, 2001, report stating its recommendation, discussed the findings from these analysis reports under the following headings:

- Conduct of Key Operations
 - Census Quality Indicators
 - A.C.E. Quality Indicators
- Comparison with Demographic Analysis
- Measures of Census and A.C.E. Quality
 - Total Error Model
 - Loss Function Analysis
- Other Factors
 - Synthetic Error
 - Balancing Error
 - Late Adds and Whole Person Imputations
 - Misclassification Error

Conduct of Key Operations. Careful review of the analysis reports led to the conclusion that census and A.C.E. operations were of high quality. All major census operations and programs were completed on time, design upgrades in these programs produced measurable improvements, and staffing and pay innovations likely contributed to the Census Bureau's ability to hire and retain high-quality temporary employees who produced good work.¹¹⁶

A.C.E. operations were also similarly successful. The Census Bureau successfully automated the matching process, implemented improved computer processing, and carried out its quality assurance operations as planned. Listing, interviewing, matching, and follow-up operations were all conducted as designed and in a controlled manner. The ESCAP concluded that the "... evidence indicates that the A.C.E. was a clear operational success."¹¹⁷

Comparison With Demographic Analysis.¹¹⁸ The inconsistency between the DA and A.C.E. estimates was chief among the ESCAP's concerns. The A.C.E. estimate of a 3.3 million net undercount was very different from the "Base DA" estimate of a 1.8 million net overcount. The Census Bureau also produced Alternative DA (Alt DA) estimates that allowed for a higher level of net undocumented immigration, for use in comparisons with the A.C.E. estimates. These yielded a net undercount estimate of 0.9 million.¹¹⁹ In developing the DA estimates, the undocumented immigration component was the most troublesome. The Census Bureau noted that it needed to research and address the inconsistencies between the A.C.E. and DA estimates, and much of the later work in reexamining the DA estimates focused on this component.

Total Error Model and Loss Function Analysis. The total error model approach identified and attempted to quantify the sources of sampling and nonsampling error in the A.C.E. estimates and of nonsampling error in the census counts. For the A.C.E., these included E-sample processing error, P-sample matching error, E- and P-sample data collection error, missing data imputation error, sampling error, misclassification error, correlation bias, contamination bias, synthetic estimation bias, and balancing error. Some of these errors are discussed below.¹²⁰

¹¹⁵ These reports, along with the ESCAP report itself, are available on the Census Bureau Web site at <<http://www.census.gov/dmd/www/EscapRep.html>>.

¹¹⁶ *Federal Register*, Vol. 66, No. 46, p. 14005.

¹¹⁷ *Ibid.*, p. 14012.

¹¹⁸ As noted earlier, the DA program is discussed in detail in the next section.

¹¹⁹ U.S. Census Bureau, J. Gregory Robinson, "Accuracy and Coverage Evaluation: Demographic Analysis Results," DSSD Census 2000 Procedures and Operations Memorandum Series B-4*, March 12, 2001, p. 2. As discussed below, revisions to the DA estimates ultimately changed these results to a net undercount estimate of about 340,000. See U.S. Census Bureau, J. Gregory Robinson, "Demographic Analysis Results," ESCAP II Report No. 1, October 13, 2001. All three DA estimates differed substantially from the March 2001 A.C.E. estimate of a 3.3 million net undercount.

¹²⁰ Appendix D of *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology* defines the A.C.E. errors in the total error model and identifies their sources.

The Census Bureau derived the components of the total error model from its evaluation studies. The total error model analysis used estimates of correlation bias and sampling error from the 2000 A.C.E., but estimates of other coverage measurement survey errors from the 1990 post-enumeration survey (PES) evaluations. That was done because estimates of the other types of errors were not yet available for the A.C.E. To add robustness to the assumption that the 1990 PES evaluations data provided appropriate baselines for estimating error in the 2000 A.C.E., a sensitivity analysis considered a large number of total error estimates under alternative assumptions.

The total error model estimates of error are the input for the loss function analyses. The Census Bureau uses loss functions to compare two sets of counts or share distributions—for example, the unadjusted versus the adjusted Census 2000 data—to determine which set is closer to the “true” count or share distribution. That is, loss functions involve comparing the census errors to the coverage measurement survey errors to determine which has the smaller “loss” when compared to the “true” counts or shares. Because the “true” count or share distribution is not known, an estimated truth (a target number or share distribution) is used to perform the loss function analysis. The Census Bureau produced estimates of the “true” population and “true” population shares (or proportions) for states and substate areas. These estimated “truths” have variances and biases associated with them, making the loss function analysis particularly complex.

Census Bureau staff used the range of total error estimates in loss function analyses to compare the Census 2000 unadjusted and adjusted data for population totals and share distributions at various levels of geography. The ESCAP studied the results and found that, using the 1990 PES evaluations data, the loss function analyses did not allow the conclusion that the Census 2000 adjusted data were inferior to the Census 2000 counts. However, this finding did not obviate the need to explore the disparity between the DA and A.C.E. estimates. Thus, the loss function analysis results, by themselves, could not be used to conclude that adjustment would improve the accuracy of the Census 2000 redistricting data. Given that for many of the error components the committee had to use the 1990 PES evaluations data in its initial analyses, much of the subsequent “ESCAP II” work (see below) focused on analyzing the A.C.E. and data from various studies to assess the level of error in the A.C.E. estimates from these other components, for example, E- and P-sample data collection error, P-sample matching error, E-sample processing error, etc. However, while the committee did investigate these and other sources of error in the A.C.E. estimates, it did not produce a second round of total error model analyses based upon updated components of error and therefore also did not produce additional loss function analyses based upon an updated total error model.¹²¹

Synthetic Error. Synthetic error is a factor in understanding coverage estimation results. It is assumed that the net census coverage, estimated by the coverage correction factor, is relatively uniform within the post-strata. Failure of this assumption results in synthetic error. For Census 2000, Census Bureau staff evaluated synthetic error in the A.C.E. estimates to help inform the ESCAP’s March 2001 recommendation.¹²² The committee was particularly concerned because synthetic error was not a component of the total error model and the loss function analyses. Most of the results of the evaluation indicated that correcting for synthetic bias would not change the loss function results (these are calculated at higher levels of aggregation where any synthetic errors would balance out). However, some results were mixed, showing that synthetic bias could have a noteworthy effect on the loss function results; this finding indicated that further evaluation was in order.¹²³

Balancing Error. An indication that geographic balancing error could be present is that the P-sample matching did not agree with the E-sample matching in the surrounding areas, because the targeted extended search had differential effects on the correct enumeration and match rates.

¹²¹ For more information on this topic, see U.S. Census Bureau, Rita J. Petroni, “Accuracy of the 2000 Census and A.C.E. Estimates Based on Updated Error Components: Total Error Model,” ESCAP II Report No. 8, October 12, 2001.

¹²² U.S. Census Bureau, Richard A. Griffin and Donald J. Malec, “Accuracy and Coverage Evaluation: Assessment of Synthetic Assumption,” DSSD Census 2000 Procedures and Operations Memorandum Series B-14*, February 28, 2001.

¹²³ See the analysis done as part of ESCAP II: U.S. Census Bureau, Richard A. Griffin and Donald J. Malec, “Sensitivity Analysis for the Assessment of the Synthetic Assumption,” ESCAP II Report No. 23, October 12, 2001.

The A.C.E. results did exhibit a “. . . much greater increase in the match rate (3.8 percent) than the correct enumeration rate (2.9 percent) . . .” in the blocks surrounding the A.C.E. sample blocks.¹²⁴ That is, there was more success finding a P-sample person in the census one block over from the person’s actual residence than in finding an E-sample person counted in the census one block from the person’s actual residence. In theory, these two increases should balance; thus, the ESCAP suspected balancing error and requested further evaluation of the matter (see below).

Late Adds and Whole Person Imputations. The absence of complete names or basic demographic data on the census form precluded matching those enumerations to the A.C.E. These cases were covered in the dual system estimate of coverage by treating them as whole person imputations; that is, they were excluded. Likewise “late adds” (those persons temporarily removed from the census) were treated as imputations in dual system estimation (DSE). The number of whole person imputations in Census 2000 was significantly greater than in the 1990 census, and ESCAP was keenly interested in the effect of this circumstance on the estimates. The evaluation indicated, and the committee agreed, that there did appear to be some geographic clustering within post-strata of cases designated as whole person imputations. The committee concluded that this might increase synthetic error, but not appreciably.¹²⁵

Misclassification Error. Finally, the ESCAP considered misclassification error, which occurred when a respondent’s census post-stratum differed from his/her P-sample post-stratum. The evaluation found that American Indians not living on reservations, and Native Hawaiians and Pacific Islanders were significantly affected by this type of error. But the extent of misclassification error was small and had negligible effect on the dual system estimates at the national level.¹²⁶

Further evaluation of the A.C.E. estimates and second decision on adjustment.

The uneven results of the initial evaluations encouraged the Census Bureau to conduct additional evaluations of the A.C.E. over the following 6 months to examine the reasons for the discrepancies with DA and to determine if the adjusted data should be used for nonredistricting purposes, including their incorporation in sample (long-form) data products, intercensal population estimates, and survey controls. The ESCAP issued a document laying out the areas of research it planned to pursue, and the process under which these additional analyses and studies were carried out was known as “ESCAP II.”¹²⁷

Two planned A.C.E. evaluation programs, the Matching Error Study and the Evaluation Follow-up, provided additional information about some, but not all, of the errors in the A.C.E.¹²⁸ The Person Duplication Study used computer matching techniques to identify large numbers of duplicate census enumerations not identified by the A.C.E. evaluation results.¹²⁹ The Census Bureau conducted additional evaluations to address other concerns such as balancing error, contamination, and bias due to missing data. Also, with the assistance of external experts, Census Bureau staff conducted further research on the components of the DA estimates, resulting in some significant revisions to the components (particularly the international migration estimates) and thus a new set of DA estimates.¹³⁰ The findings from the above-referenced areas of study are summarized below.

The ESCAP II analyses confirmed the committee’s serious concerns regarding the accuracy of the A.C.E. estimates. Analysis of A.C.E. evaluation data and the results of the Person Duplication Study revealed that the A.C.E. failed to measure large numbers of erroneous census enumerations, many

¹²⁴ *Federal Register*, Vol. 66, No. 46, p. 14016.

¹²⁵ *Ibid.*, p. 14017.

¹²⁶ *Ibid.*

¹²⁷ U.S. Census Bureau, “Analysis Plan for Further ESCAP Deliberations Regarding the Adjustment of Census 2000 Data for Future Uses,” Executive Steering Committee for Accuracy and Coverage Evaluation Policy, July 26, 2001.

¹²⁸ U.S. Census Bureau, Susanne L. Bean, “ESCAP II: Accuracy and Coverage Evaluation Matching Error,” ESCAP II Report No. 7, October 12, 2001; U.S. Census Bureau, David A. Raglin and Elizabeth A. Krejsa, “ESCAP II: Evaluation Results for Changes in Mover and Residence Status in the A.C.E.,” ESCAP II Report No. 16, October 15, 2001.

¹²⁹ U.S. Census Bureau, Robert E. Fay, “Evidence of Additional Erroneous Enumerations from the Person Duplication Study,” ESCAP II Report No. 9, October 26, 2001 (preliminary version); U.S. Census Bureau, Robert E. Fay, “Evidence of Additional Erroneous Enumerations from the Person Duplication Study,” ESCAP II Report No. 9, March 27, 2002 (revised version).

¹³⁰ U.S. Census Bureau, J. Gregory Robinson, “Demographic Analysis Results,” ESCAP II Report No. 1, October 13, 2001.

of which were duplicates, resulting in an overstatement of the net undercount of between 3 and 4 million persons. This error alone was sufficient to call into question the quality of the A.C.E. estimates, and coupled with the revisions to the DA estimates, provided an explanation for the previously observed inconsistency with DA. The earlier concerns with A.C.E. balancing error, contamination, and bias due to missing data had also been resolved. Contamination bias was determined not to be an important source of error and the level of other errors, including synthetic error, was also found to be minimal by comparison and therefore not a major factor in the second ESCAP recommendation.

Given the level of error in the A.C.E. measurement of net coverage, the ESCAP recommended against the use of the adjusted data for nonredistricting purposes.¹³¹ The Acting Director adopted the ESCAP's recommendation. On October 16, 2001, he informed the Commerce Department's under secretary for economic affairs that the Census Bureau would release Census 2000 long form (sample) data products, intercensal estimates, and survey controls using unadjusted data.¹³²

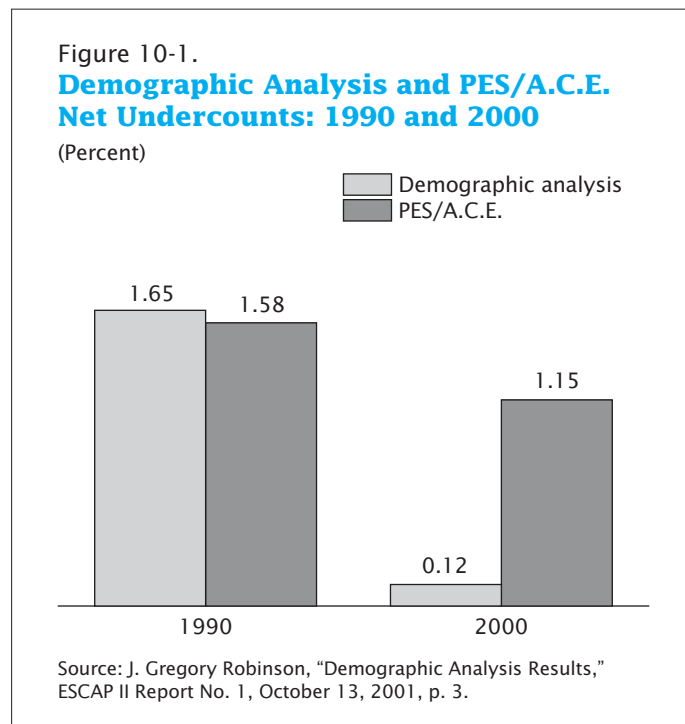
Production of revised demographic analysis estimates. The Census Bureau determined that the international migration factor in the DA estimates required additional research and analysis, including examination of relevant sample data from Census 2000. The agency also committed to reexamining other component data. This research and analysis resulted in revisions to the component data and thus a revised set of DA estimates (September 2001 DA estimates). The revised component data and detailed estimates by sex, race, and age are presented and discussed in the "Demographic Analysis" section of this chapter; therefore, it is sufficient to note here that the net effect of these revisions was a reduction in the DA estimate of the total population by about 576,000. Thus, the September 2001 DA estimate of Census 2000 net undercount of 0.12 percent was in greater disagreement with the March A.C.E. estimate of 1.15 percent than was the March "alternative" DA estimate of 0.32 percent net undercount.¹³³

¹³¹ *Federal Register*, Vol. 66, No. 214 (November 5, 2001), pp. 56006–21. The ESCAP II report (along with the underlying analysis reports) is also available on the Census Bureau's Web site at <<http://www.census.gov/dmd/www/EscapRep2.html>>.

¹³² *Federal Register*, Vol. 66, No. 214, p. 56006.

¹³³ "Demographic Analysis Results," ESCAP II Report No. 1, October 13, 2001, p. 3.

The difference between these two estimates was large; whereas, the 1990 PES and DA estimates were very close. The following graph (Figure 10-1) indicates that consistency and the disparity between the DA and A.C.E. estimates in 2000:



Balancing error revisited. The ESCAP expressed concerns about balancing error in the A.C.E. In theory, in a coverage measurement survey, the expected number of correct enumerations in the blocks surrounding the sample blocks should equal the number of matches in surrounding blocks. The A.C.E. found about 3 million more matches in surrounding blocks than correct enumerations.¹³⁴

Immediately after the March 2001 decision, the Census Bureau mounted field follow-up efforts to explore the balancing issue. Field representatives checked the location of a sample of census housing units that had been coded as erroneous enumerations to determine if they were inside or outside of the A.C.E. sample block and surrounding ring of blocks. In addition, they checked units in the A.C.E. sample to see how often they were mistakenly included in the sample blocks, but really existed in a block surrounding the sample block. The Census Bureau determined that this type of error—known as A.C.E. sample geocoding error—was the major cause of the apparent balancing error. Because the surrounding blocks were searched in A.C.E. matching, these A.C.E. geocoding errors had little or no effect on the undercount estimates.¹³⁵

Missing data. After staff completed A.C.E. field operations, data on some households continued to be missing or had not been completely collected in the interview(s). The missing data included such items as enumeration status, residency (on Census Day) status, and match status. As part of ESCAP II, the Census Bureau considered ways to deal with these missing data, including seven different missing data treatment methods. Each method resulted in new undercount estimates. The alternatives considered indicated that the choice of missing data model could have a significant effect on the resulting estimates of coverage error. Specifically, the standard deviation of the point estimates of the alternative methods (with some models excluded) was found to be approximately equal to the standard error of the A.C.E. estimates themselves.¹³⁶ Thus, there was about as much variation in the estimates due to the choice of a missing data model as there was from DSE sampling error.

¹³⁴ *Federal Register*, Vol. 66, No. 214, p. 56014.

¹³⁵ *Ibid.*, pp. 56014–15.

¹³⁶ *Ibid.*, p. 56014.

High level of error in the A.C.E. measurement of net coverage in Census 2000.

Coverage measurement surveys are dependent on good matching of the E- and P-samples. The Census Bureau conducted two evaluations to measure whether the matching for 2000 was done correctly: the Matching Error Study (MES) and the Evaluation Follow-up (EFU).

The MES determined that matching error caused the A.C.E. to overstate the national population by 385,000 people due to errors in the match rate. However, the matching results were more consistent in 2000 than in the 1990 PES. In 1990, the gross PES sample matching error rate (nonmatch to match and match to nonmatch) was 1.55 percent; the net rate was 0.93 percent. In Census 2000, the gross rate was 0.46 percent and the net equal to 0.41 percent.¹³⁷

The EFU P-sample component concentrated on the residence status of sample people (that is, whether they were in fact residing in the sample areas on Census Day) and their mover status (that is, whether they had moved in or out between Census Day and their A.C.E. interview day). The EFU uncovered error that, for the most part, offset the error found in the MES. The EFU showed that misclassification of movers (for example, people who had moved in at the time of the A.C.E. interview being mistakenly classified as Census Day residents) resulted in an underestimate of the DSE by about 450,000 persons.¹³⁸ Combined, these two studies established a net difference in the undercount estimates of a mere 65,000 people.

By far the most significant problem the Census Bureau identified in the A.C.E. survey was that the A.C.E. did not measure a significant portion of erroneous enumerations in the census. Evaluations available for the ESCAP II recommendation indicated that the A.C.E. failed to identify approximately 3 million erroneously enumerated people.¹³⁹

The EFU study and the person duplication evaluations played a significant role in this finding. Initially, the EFU E-sample component indicated that a large number of erroneous enumerations were missed by the A.C.E.; the EFU found an additional 1.9 million people who were erroneously enumerated in addition to the 4.2 million found by the A.C.E. Also, the EFU found about 4.5 million cases that could not be resolved. Because of the potentially significant implications of these estimates, the Census Bureau undertook a very careful review of the EFU data and design. It selected a "review sample" for which the matching was repeated. This time, the Census Bureau's most experienced clerks at its National Processing Center (NPC) facility in Jeffersonville, IN, conducted the matching. They detected some changes from the production matching. Their review estimated that Census 2000 erroneously enumerated 1.45 million people in addition to those identified by the A.C.E. Further, the clerks employed a conservative approach in coding difficult cases and concluded that over 15 million cases could not be resolved or had conflicting data.

Coincidental with the NPC review, the Census Bureau conducted person duplication evaluations that applied computer matching to the data for the entire population. This was done to search for duplicates of the A.C.E. sample cases; for example, E-sample cases duplicated elsewhere might be erroneous enumerations. Because the A.C.E. had done a complete (including clerical work) search for duplicates within the sample areas and, for targeted extended search cases, their surrounding blocks, the national computer-only duplicate search results could be compared to the A.C.E. results to provide a measure of A.C.E.'s efficacy in identifying duplicates.

The rough error in the A.C.E. estimates due to the mismeasurement of erroneous enumeration, including duplication, could be approximated by combining the EFU results with the duplication studies' results. The Census Bureau estimated this error, which was not measured in the A.C.E., at about 3 million persons. Additionally, combining the EFU and duplication studies suggested an estimate of about 800,000 additional erroneous enumerations in the large pool of unresolved and conflicting cases for which the status of correct enumeration had been imputed.¹⁴⁰

¹³⁷ U.S. Census Bureau, Susanne L. Bean, "Accuracy and Coverage Evaluation Matching Error," ESCAP II Report No. 7, October 12, 2001, p. 9.

¹³⁸ U.S. Census Bureau, David A. Raglin and Elizabeth A. Krejsa, "ESCAP II: Evaluation Results for Changes in Mover and Residence Status in the A.C.E.," ESCAP II Report No. 16, October 15, 2001, p. 14.

¹³⁹ *Federal Register*, Vol. 66, No. 214, p. 56013.

¹⁴⁰ *Ibid.*

Release of “revised early approximations” of Census 2000 net undercount. On October 17, 2001, the Census Bureau Acting Director publicly announced the decision not to adjust the Census 2000 sample data products, intercensal estimates, and survey controls. He had previously informed the Commerce Department’s under secretary for economic affairs that the A.C.E. estimates were so flawed that significant additional review and analyses would be required to revise the data before they could be used for any purposes. The Acting Director noted that such work might result in revised A.C.E. estimates that could be used for programmatic purposes such as improving the accuracy of intercensal estimates in subsequent years.¹⁴¹

At the October 17 press conference, in order to fully explain its decision on adjustment for nonredistricting purposes, the agency released “revised early approximations” of net undercount in Census 2000 for three race/ethnicity groupings and the total population. These revised preliminary estimates were not part of the ESCAP’s October 17, 2001, report, but were produced at the request of the Acting Director. They corrected for estimates of erroneous enumerations, including duplicates, identified in the A.C.E. evaluations but not in the full A.C.E. E-sample.¹⁴² The purpose of the “revised early approximations” was to illustrate the effect on the A.C.E. estimates of potential future revisions that accounted for the erroneous enumerations not measured by the A.C.E. The same methodology and data were used later to expand the calculations to all seven major race/Hispanic origin groups.¹⁴³ These preliminary estimates showed a very small net undercount; they also indicated that the differential undercount had not been eliminated. These results were limited to the extent that they provided information only at the national level for broad population groups. Furthermore, these preliminary approximations were based on a small subset of A.C.E. data and only partially corrected for errors in measuring erroneous enumerations using a conservative estimate of computer efficiency in finding duplicate links.¹⁴⁴ Additionally, the methodology for making these revisions to the estimates did not take into account potential errors in measuring omissions.

Census Bureau embarks on A.C.E. Revision II research. Even though the ESCAP recommended twice against the use of the adjusted data, the committee had concerns about differential coverage in Census 2000. The committee thought it possible that further research might result in revised estimates of coverage that addressed the differential net coverage exhibited in the unadjusted Census 2000 data. These estimates could be used to adjust and thereby improve postcensal estimates. In addition, work on revised estimates would provide a better understanding of Census 2000 coverage error that could be used to improve census operations for 2010 as well as help develop enhanced methodologies for the 2010 Census coverage measurement program. Thus, in the fall of 2001, the Census Bureau began work on revising the A.C.E. estimates to correct for detected errors; this effort became known as A.C.E. Revision II.

The major objective of A.C.E. Revision II was to produce improved estimates of net coverage error in Census 2000. Because the national net undercount, as indicated by both DA and the “revised early approximations” (released on October 17, 2001), was very small, and the census included large numbers of erroneous enumerations in the form of duplicates, it was imperative that the revised methodology thoroughly account for both overcounts and undercounts. This meant obtaining better estimates of erroneous census enumerations from the E-sample and obtaining

¹⁴¹ *Federal Register*, Vol. 66, No. 214, p. 56006. Intercensal (or postcensal) population estimates are produced annually for the nation, states, and counties (and biennially for smaller geographic areas) and are generally used in federal funding-allocation formulae in lieu of decennial census figures (except for the year in which the census figures are released) because they reflect ongoing population changes during the decade. The most recent decennial census provides the base for calculating these estimates.

¹⁴² John H. Thompson, Preston J. Waite, and Robert E. Fay, “Basis of ‘Revised Early Approximation’ of Undercounts Released Oct. 17, 2001,” ESCAP II Report No. 9a, October 26, 2001.

¹⁴³ U.S. Census Bureau, “Revised Preliminary Estimates of Net Undercounts for Seven Race/Ethnicity Groupings,” DSSD A.C.E. Revision II Memorandum Series PP-2. A PDF version of this memorandum can be accessed from the Census Bureau’s Web site at <<http://www.census.gov/dmd/www/ace2.html>>.

¹⁴⁴ “Evidence of Additional Erroneous Enumerations from the Person Duplication Study,” ESCAP II Report No. 9, March 27, 2002 (revised version).

better estimates of census omissions from the P-sample. The Census Bureau summarized the major issues it needed to address in conducting this work in the form of the following five challenges:

- (1) Improve estimates of erroneous enumerations.
- (2) Improve estimates of census omissions.
- (3) Develop new models for missing data.
- (4) Enhance the estimation post-stratification.
- (5) Consider adjustment for correlation bias.¹⁴⁵

The A.C.E. Revision II process called for no new field operations. The late date meant revisiting households for additional data collection was infeasible. Consequently, the revisions the Census Bureau undertook were based on existing data. One aspect of the strategy for revising the coverage estimates involved correcting measurement errors using information from the A.C.E. evaluation data. This was referred to as the Measurement Correction Study. Another facet of these corrections involved conducting a more extensive duplicate study to obtain data for correcting measurement error due to duplication not detected by the A.C.E. evaluations. This study was referred to as the Further Study of Person Duplication.¹⁴⁶ The estimation method, discussed briefly below, was designed to handle the overlap of errors detected by both studies and thus avoid overcorrecting for measurement error.¹⁴⁷

Measurement Correction Study. This study was designed to improve estimates of both erroneous census enumerations and census omissions by correcting for errors in the data collected by the A.C.E. It combined the original A.C.E. person interview (PI) and person follow-up (PFU) data with data from the Evaluation Follow-up (EFU) interview, the Matching Error Study (MES), and the review sample¹⁴⁸ to correct for data collection error in enumeration status, residence status, mover status, and matching status. This effort involved extensive recoding of about 60,000 P-sample cases and more than 70,000 E-sample cases.¹⁴⁹ The Census Bureau used an automated computer algorithm to recode most of the cases, but some cases required a clerical review by experienced analysts at the NPC. These analysts had access to the questionnaire responses as well as to interviewer notes, which put them in a better position to resolve apparent discrepancies in the data collected, though missing or conflicting information made it impossible to recode all of the data.

The Census Bureau developed new missing data models to reflect the following types of missing/conflicting data that could result from the recoding operation:

- (1) P-sample households that were originally considered interviews but that recoding determined had no valid Census Day residents in the household.
- (2) Cases with unresolved match, enumeration, or residency status because of incomplete or ambiguous interview data.
- (3) Cases in which enumeration or residency status could not be determined due to contradictory information collected in the A.C.E., PFU, and EFU interviews.

¹⁴⁵ U.S. Census Bureau, Howard Hogan, "Five Challenges in Preparing Improved Post-Censal Population Estimates," DSSD A.C.E. Revision II Memorandum Series PP-1, January 25, 2002.

¹⁴⁶ U.S. Census Bureau, Thomas Mule, "Accuracy and Coverage Evaluation Revision II: Further Study of Person Duplication," DSSD A.C.E. Revision II Memorandum Series PP-51, April 4, 2002.

¹⁴⁷ The estimation method is described more fully in *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section II, Chapters 2–5.

¹⁴⁸ The PFU/EFU review study was not a planned evaluation. It was a special study conducted using a subsample of the evaluation data to resolve discrepancies in enumeration status between the PFU and EFU.

¹⁴⁹ These are probability subsamples of the original A.C.E. P- and E-samples. In the context of A.C.E. Revision II they are called "revision samples," but they are in fact equivalent to the EFU samples. See *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section II, Chapter 3, for additional information on this issue.

The Census Bureau implemented a household noninterview weighting adjustment using new cell definitions for cases that fit the situation described in (1). Staff developed imputation cells and donor pools for the second type of missing data based on detailed responses to the questionnaires. Because no applicable donor pools existed for the conflicting cases in (3), the Census Bureau imputed probabilities of 0.5 for correct enumeration status and Census Day residency status. Fortunately, the measurement error corrections resulted in a relatively small number of these cases.

Further Study of Person Duplication (FSPD). The FSPD was designed to provide information to improve estimates of both erroneous census enumerations and census omissions. This study used computer matching and modeling techniques to identify E-sample and P-sample cases that linked to (matched) another census enumeration anywhere in the country, including group quarters enumerations, and reinstated and deleted census cases. For the E-sample links, the study could not generally determine which enumeration was correct and which was the duplicate, and for P-sample links, whether the census location or the P-sample location was the correct Census Day residence. Instead, Census Bureau staff used study data to model the probability that an E-sample linked case was a correct enumeration or that a P-sample case was a resident of the sample block cluster on Census Day.

Estimation methodology. The revised estimates incorporated separate post-strata for estimating census omissions than for erroneous census enumerations because the causes of each were likely to be different. Though much previous work on developing post-strata focused on census omissions and used the same post-strata to estimate erroneous enumerations, A.C.E. Revision II research efforts focused on determining variables related to explaining variations in rates of erroneous enumerations. The Census Bureau made changes for the E-sample by eliminating some of the original post-stratification variables and adding others. For example, staff replaced variables such as region, metropolitan statistical area/type of enumeration area, and tract return rate with proxy status, type and date of census return, and household relationship and size, and modified age groups to define separate post-strata for children aged 0 to 9 and those 10 to 17. Census Bureau staff made this last modification to the P-sample post-strata as well. The Census Bureau made this modification because the DA estimates suggested different coverage for younger versus older children.

The Census Bureau used estimated correct enumeration and match rates to calculate dual system estimates (DSEs) for the cross-classification of the E-sample and P-sample post-strata. The specific form of the A.C.E. Revision II DSE was the same as for the original A.C.E.—using the census count, the data-defined rate, the correct enumeration rate, and the match rate—but the data that were used needed revisions. These revisions included multiple adjustments in the construction of correct enumeration rates and match rates to account for duplicates, which were treated separately from the remainder of the E- and P-samples, and for the measurement error for the nonduplicates. The measurement error was accounted for by double sampling adjustments to adjust the A.C.E. correct enumeration rates or match rates for the nonduplicates by the change in these rates for the revision sample. This double sampling adjustment was necessary because the revision sample was too small to give reliable correct enumeration and match rates but was adequate to estimate the change in these rates.¹⁵⁰

Adjustment for correlation bias. The A.C.E. Revision II DSEs included an adjustment for correlation bias. Correlation bias exists if (within P-sample post-strata) people missed in the census were more likely (or less likely) to also be missed in the A.C.E. In the “more likely to be missed” scenario, correlation bias has a downward effect on estimates. Although statisticians have long thought that correlation bias exists, previous coverage measurement surveys estimated results as net undercounts, and making corrections would have increased the DSEs and thus the estimated undercount in the census. The conservative approach of not adjusting estimates for correlation bias had the effect of understating the net undercount, which resulted in DSEs that were larger

¹⁵⁰ For a detailed discussion of the estimator, see *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section II, Chapter 6.

than the census counts but not as large as they would be with the bias adjustment. In the presence of overcounts for A.C.E. Revision II, DSEs without correlation bias adjustment might have moved the estimates further away from the true population total, and they could actually have had greater error relative to unadjusted census counts.

The Census Bureau calculated estimates of correlation bias in A.C.E. Revision II using the “two-group model” and sex ratios obtained from DA data.¹⁵¹ It calculated correlation bias estimates for adult males only under the assumption of no correlation bias for adult females. DA sex ratios provided evidence of correlation bias and permitted the estimation for adult males at the national level for age-race groups.¹⁵² For example, in Census 2000, DA estimated 897.2 Black males ages 18 to 29 for every 1,000 Black females ages 18 to 29 in the housing unit population, while A.C.E. Revision II estimated only 830.3 Black males. The difference in the two sets of estimates was attributed to the correlation bias in the coverage measurement survey DSEs.

The Census Bureau implemented correlation bias adjustments separately for Blacks and non-Blacks within three age categories: 18 to 29, 30 to 49, and 50 and over, with the exception of non-Black males 18 to 29 years of age, a group for which the A.C.E. Revision II sex ratio was already higher than the DA sex ratio. As an example of how the adjustment was implemented, the estimates for all post-strata for Black males 18 to 29 were adjusted upwards by the factor $897.2/830.3 = 1.0806$, so that the DA sex ratio would be achieved for that age-race group. The model used to carry out the adjustments assumed that relative correlation bias was constant over male post-strata within the age-race groups.

The Census Bureau used DSEs—adjusted for correlation bias—to produce coverage correction factors for each of the cross-classified post-strata (E-sample post-strata cross-classified with the P-sample post-strata). Analysts applied (carried down) these factors within the post-strata to produce estimates for geographic areas such as places and counties. This process, referred to as synthetic estimation, was summarized earlier (see “Synthetic estimation for small areas”).

The stratified jackknife approach employed to estimate variances for the A.C.E. could not be readily adapted to reflect the effect of the correlation bias adjustment on variance estimates. Because this effect was large for some groups, the Census Bureau decided to employ a simple jackknife procedure that gave similar results for estimates without correlation bias adjustment, but that could be modified to reflect the correlation bias adjustment.¹⁵³

Summary of the methodology; changes to the March 2001 A.C.E. estimates. In summary, the A.C.E. Revision II DSE incorporated the following enhancements to a traditional DSE:

- New post-stratification to reflect different factors related to erroneous inclusions and omissions.
- Corrections to the correct enumeration rate from the Further Study of Person Duplication.
- Corrections to the correct enumeration rate from the Measurement Correction Study.
- Corrections to the match rate from the Further Study of Person Duplication.
- Corrections to the match rate from the Measurement Correction Study.
- Adjustment for correlation bias.

The impact of these revisions can best be seen by looking at the numerical effects of incorporating one change at a time to the DSE. Table 10-1 below shows the impact of each change relative to the March 2001 A.C.E. estimate of national net undercount.

¹⁵¹ U.S. Census Bureau, Roger Shores, “A.C.E. Revision II: Adjustment for Correlation Bias,” DSSD A.C.E. Revision II Memorandum Series PP-53, March 4, 2003.

¹⁵² The DA methodology permits development of coverage estimates for the Black and non-Black race groupings only.

¹⁵³ For more information on the calculation of these variances, see *Accuracy and Coverage Evaluation of Census 2000: Design and Methodology*, Section II, p. 7-1.

Table 10-1.
Change in Estimated Net Undercount
 (Household population in millions)

Category	Net undercount	Change ¹ to undercount	Cumulative undercount
March 2001 A.C.E. estimate	3.26		
New post-stratification		0.04	3.30
E-Sample: Further Study of Person Duplication		2.81	0.49
Measurement Correction Study		-2.43	-1.94
P-Sample: Further Study of Person Duplication		-1.10	-3.04
Measurement Correction Study		0.01	-3.03
Correlation bias		1.70	1.33
A.C.E. Revision II estimate	-1.33	-4.59	

¹ Shows the effect of adding in one revision at a time. A different ordering of the revisions would result in slightly different intermediate effects, but yield the same overall net undercount estimate. Estimated change in the net undercount is not the same as estimated additional erroneous enumerations or additional census omissions.

Source: U.S. Census Bureau, Donna Kostanich and Dawn E. Haines, "Census 2000 Accuracy and Coverage Evaluation Revision II," undated, pp. 4-5.

This table starts with the March 2001 A.C.E. estimate of a national net undercount of just under 3.3 million persons. Each row shows the effect on the net undercount estimate of making a specified revision. Using only the new post-stratification and making no other correction would increase the estimated net undercount to 3.3 million, an increase of less than 39,000. Though the effect of the new post-stratification is small at the national level, it has considerably more impact on subnational estimates, particularly for small areas. Corrections to the correct enumeration rate, if the first adjustment is to correct for those identified by the Further Study of Person Duplication (FSPD), reduce the estimated net undercount by 2.8 million. The correct enumeration rate corrections from the Measurement Correction Study reduce the estimated net undercount by another 2.4 million, resulting in an estimated net overcount of 1.9 million. Adding corrections to the match rate based on the FSPD reduces the estimated net undercount by another 1.1 million. Then, adding in such corrections from the Measurement Correction Study causes the estimated net undercount to increase slightly, but by only 11,000. Finally, corrections for correlation bias increase the estimated net undercount by 1.7 million, yielding the A.C.E. Revision II estimate of a 1.3 million (0.49 percent) net overcount.¹⁵⁴

Summary of A.C.E. Revision II results. Table 10-2 shows A.C.E. Revision II estimates of percent net undercount in Census 2000 for the total household population and major demographic groups. For comparison, Table 10-2 also shows results from the March 2001 A.C.E. estimates. As just noted, A.C.E. Revision II estimates a negative net undercount, or overcount, of the Census 2000 household population of 0.49 percent. This differs sharply from the March 2001 A.C.E. estimate of a 1.18 percent net undercount, an estimate now known to be flawed due to the effects of (among other things) undetected duplicates and data collection error in establishing Census Day residency status.

Among the A.C.E. Revision II coverage estimates by race/Hispanic origin domains, only those for the non-Hispanic White and non-Hispanic Black domains show estimated net undercounts differing significantly from zero. The non-Hispanic White domain has an estimated net undercount of negative 1.13 percent, thereby reflecting a net overcount, while the non-Hispanic Black domain has an estimated net undercount of 1.84 percent.

Table 10-2 also shows differential coverage estimates with respect to tenure. Nationally, A.C.E. Revision II estimates owners to have a net overcount of 1.25 percent and nonowners a net undercount of 1.14 percent. These estimated net undercount rates differ significantly from zero, and the difference between the two estimates is also statistically significant.

¹⁵⁴ For further information about how these revisions affect race/ethnic groups, see U.S. Census Bureau, Thomas Mule, "A.C.E. Revision II Results: Change in Estimated Net Undercount," DSSD A.C.E. Revision II Memorandum Series PP-58, March 4, 2003, pp. 7-9.

Additionally, the A.C.E. Revision II estimates show coverage differentials by age and sex. In particular, the estimated net overcounts for the following age/sex groups are statistically significant: children ages 10 to 17; adult females 18 to 29, 30 to 49, and 50 and over; and males 50 and over. (The net overcount estimate for children 0 to 9 is not significantly different from zero.) In contrast, the Census Bureau estimates statistically significant net undercounts for males 18 to 29 and 30 to 49. Of course, it should be noted that the coverage differences by sex are affected by the correlation bias adjustments that increased the undercount estimates for adult males.

Table 10-2.
Net Undercount for Major Groups
(In percent)

Characteristic	A.C.E. Revision II		A.C.E. March 2001	
	Estimate	Standard error	Estimate	Standard error
Total	-0.49	0.20	1.18	0.13
Race/Hispanic Origin Domain				
Non-Hispanic White	-1.13	0.20	0.67	0.14
Non-Hispanic Black	1.84	0.43	2.17	0.35
Hispanic	0.71	0.44	2.85	0.38
Non-Hispanic Asian	-0.75	0.68	0.96	0.64
Hawaiian or Pacific Islander	2.12	2.73	4.60	2.77
American Indians on reservation	-0.88	1.53	4.74	1.20
American Indians off reservation	0.62	1.35	3.28	1.33
Tenure				
Owner	-1.25	0.20	0.44	0.14
Nonowner	1.14	0.36	2.75	0.26
Age, Sex				
0 to 9 ¹	-0.46	0.33	1.54	0.19
10 to 17 ¹	-1.32	0.41	1.54	0.19
18 to 29, male	1.12	0.63	3.77	0.32
18 to 29, female	-1.39	0.52	2.23	0.29
30 to 49, male	2.01	0.25	1.86	0.19
30 to 49, female	0.60	0.25	0.96	0.17
50 or older, male	-0.80	0.27	-0.25	0.18
50 or older, female	-2.53	0.27	-0.79	0.17

¹ For March 2001, the "0 to 17" Age, Sex group was a single group. Therefore, the net undercount and standard error for children "0 to 9" and "10 to 17" are identical.

Note: A negative net undercount denotes a net overcount.

Source: U.S. Census Bureau, Donna Kostanich, "Technical Assessment of A.C.E. Revision II," DSSD A.C.E. Revision II Memorandum Series, PP-61, March 12, 2003, p. 12 (table reproduced in part).

Decision on intercensal population estimates. The results from the A.C.E. Revision II methodology represented a dramatic improvement from the March 2001 A.C.E. results. The data provided the Census Bureau's best estimates of coverage error present in Census 2000. Several technical issues remained, however, including uncertainty about the adjustment for correlation bias, concerns about errors from synthetic estimation, and inconsistencies between DA and A.C.E. Revision II estimates of the coverage of children ages 0 to 9. With regard to this last area of concern, DA estimated a relatively large net undercount of 2.56 percent for this group, while the A.C.E. Revision II estimate, as mentioned earlier, was not statistically different from zero.¹⁵⁵ The DA estimate for this group was produced principally from administrative data on births since the previous census and was considered to be quite accurate. This raised questions about this particular A.C.E. Revision II estimate and possibly about the methodology in general. The above-noted concerns and others, taken together, led the Census Bureau to decide that the A.C.E. Revision II estimates would not be used to adjust the base—that is, the Census 2000 data—for producing the intercensal population estimates.¹⁵⁶

¹⁵⁵ U.S. Census Bureau, "Decision on Intercensal Population Estimates," March 12, 2003, p. 7 (PDF version).

¹⁵⁶ The decision is documented in U.S. Census Bureau, "Decision on Intercensal Population Estimates," March 12, 2003. For an in-depth assessment of the A.C.E. Revision II estimates and the associated technical concerns, see "Technical Assessment of A.C.E. Revision II," March 12, 2003.

Implications for the 2010 Census. The A.C.E. Revision II effort has improved the Census Bureau's understanding of Census 2000 errors. It will also help the agency develop better methodologies for the conduct of the 2010 Census and the associated coverage measurement program. The A.C.E. Revision II research and analyses suggest several areas of additional research and possible testing for 2010:

- The agency should develop better methods to detect, evaluate or measure, and correct census erroneous enumerations, particularly duplicates. Clearly, the Census Bureau should make efforts to reduce the number of duplicates that occur in the first place, as well as investigate ways to determine which member of a duplicate pair is the correct one.
- The Census Bureau should conduct cognitive research on and testing of simplified, more understandable Census Day residence rules. The agency should focus not only on clarifying the rules, but also on ways to improve questionnaires for both the census enumeration and the coverage measurement interview. The research should pay particular attention to difficult enumeration situations involving college students, children in joint custody, and individuals with more than one residence.
- The Census Bureau should devote significant research and testing to minimizing error caused by proxy data. Clearly, census operations should be designed to limit the introduction of proxy data in the first place, and systems should be developed to improve the quality of the data when proxy data must be used.

Demographic Analysis (DA)

Introduction. The Census Bureau uses DA methodology to:

- Develop population estimates.
- Evaluate census coverage and the demographic “consistency” of gathered data.
- Validate coverage measurement survey estimates of net census coverage.

While DA is used extensively in support of the Census Bureau's population estimates and projections programs, the discussion here focuses on its use as a benchmark to evaluate Census 2000 results and assess the Accuracy and Coverage Evaluation (A.C.E.) estimates.

DA also uses administrative data on the nation's housing stock to provide independent housing benchmarks that enable the Census Bureau to assess the completeness of its address lists (the master address file, or MAF) and evaluate housing unit coverage in the census.

Methodology.¹⁵⁷ DA uses the basic demographic accounting equation of population components of change to produce estimates of the population under age 65. Estimates are calculated for single-year birth cohorts:

$$\text{Population} = \text{Births} - \text{Deaths} + \text{Immigration} - \text{Emigration}$$

The birth, death, and (legal) immigration components are drawn from administrative data. Emigration and undocumented immigration figures are based on estimates. Because of the lack of comprehensive vital statistics records prior to the mid 1930s and the relative completeness of data on Medicare enrollments, Medicare data are used to produce estimates for the population aged 65 and older.

Using components of change, the estimated population for a birth cohort can be carried forward through time to derive estimates of net undercount in a series of censuses as the cohort ages. Thus, DA is perhaps more useful in providing information about trends and changes in census

¹⁵⁷ This brief summary of the methodology is based on information from “Demographic Analysis” in *Encyclopedia of the Census*, pp. 164–65. For detailed information on the DA methodology, including the procedures used for calculating the 2000 population estimates, see Appendixes A, B, and C in U.S. Census Bureau, J. Gregory Robinson, “Accuracy and Coverage Evaluation Survey: Demographic Analysis Results,” DSSD Census 2000 Procedures and Operations Memorandum Series B-4*, March 12, 2001.

coverage over time than it is in providing precise measures of net coverage in any one census, although the linkage of the estimates over time through the cohorts does provide some basis for judging the validity of the estimates themselves.

Limitations of the DA methodology.¹⁵⁸ The Census Bureau has used DA extensively since the 1960 census as a tool for evaluating net census coverage. The methodology has been refined significantly since 1960, but significant known limitations remain. Most notably, DA estimates do not provide measures of population down to the smallest geographic areas (such estimates would require independent estimates of internal migration). Instead, DA focuses on evaluating census counts and coverage measurement survey results for age/sex/race groups at the national level, as was the case for Census 2000.¹⁵⁹

Further, given its reliance on administrative records and estimates for various components or sub-components of the accounting equation, most data sources for DA estimates do not contain the detailed race and ethnicity (Hispanic or not Hispanic) groupings captured in the census. The end result is that DA produces reliable estimates for only two race categories: Black (or African American) and non-Black (all other races).

The decision to permit Census 2000 respondents to select one *or more* races in responding to the race question complicated the issue. For example, for the segment of the population in Census 2000 that selected Black or African American *and* one or more additional races, it was not clear how these respondents' races would be reflected in the administrative records relied upon by DA. Additionally, concerns existed about the ability to make historical comparisons with DA estimates of net coverage in 1990 and earlier censuses. Thus, for purposes of calculating DA estimates of Census 2000 net undercount by race, the Census Bureau developed two models of tabulating the census data for those selecting Black: Model 1—returns in which only “Black” was selected; and Model 2—returns in which “Black” was selected, irrespective of other race categories selected. The Census Bureau also calculated DA estimates of net undercount based on an average of the estimates under the two models.¹⁶⁰ This complicating factor increased the importance of using sex ratios as a basis for making inferences about net coverage by race. DA sex ratios¹⁶¹ are compared to A.C.E. sex ratios to determine the presence of correlation bias in the coverage measurement survey estimates. The findings from the sex ratio comparisons, which are discussed below, were minimally affected by the model used.

Because the administrative data that DA uses have been corrected for certain types of errors and the estimated components (or subcomponents) of the demographic equation are not based on a scientific sample survey, it is difficult to determine the level of uncertainty associated with DA estimates. In other words, bias is the major error component affecting the quality of the DA estimates, and the Census Bureau does not have acceptable methods to measure the bias.

Use of DA to evaluate the census master address file. In the lead-up to Census 2000, the Census Bureau sought to assess the completeness of its MAF. Beginning in January 2000, the agency used subnational housing unit benchmarks to conduct a systematic demographic assessment of the December 1999 version of the file.¹⁶² This analysis, which extended into early summer of 2000, provided the first empirical evidence of excessive “overcoverage”—that is, duplicate addresses—in the MAF for many areas. For example, the housing unit count for Cook County, IL, in the December 1999 MAF was 20 percent higher than the DA housing unit benchmark.¹⁶³

¹⁵⁸ The information in this section is summarized from “Accuracy and Coverage Evaluation Survey: Demographic Analysis Results,” pp. 1–2.

¹⁵⁹ The Census Bureau also conducted a formal evaluation to assess the consistency of Census 2000 data with subnational DA benchmarks. It is summarized in the section of this chapter dealing with the Census 2000 Evaluation Program.

¹⁶⁰ The average is the midpoint of the range between the two estimates.

¹⁶¹ Calculated separately for the “Black” and “non-Black” race categories, the sex ratio is defined as the number of males per 100 females.

¹⁶² The MAF is continuously updated through various operations. See Chapter 8, “Addresses and Questionnaire Printing and Mailing” for information on address list development and updating activities.

¹⁶³ U.S. Census Bureau, Kirsten K. West, “Results From the County Level Demographic Benchmark Analysis of the Decennial Master Address File—Part B: Differences in Excess of 10 Percent for Selected Types of Enumeration Areas,” Count Review Memorandum Series 99-02, February 15, 2000.

This finding and its confirmation by subsequent field work encouraged the Census Bureau to conduct address and person matching operations to remove duplicate addresses from the MAF and the housing unit and person records associated with these addresses from the census file.¹⁶⁴ About 58 percent of the approximately 2.4 million MAF addresses initially identified as potential duplicates in these operations were permanently removed.¹⁶⁵ These actions doubtless resulted in improved census accuracy.

The role of DA in assessing the A.C.E. estimates for the adjustment decision.

As it did in 1990, the Census Bureau planned to use national-level DA estimates to assess the coverage measurement survey (the A.C.E.) results in Census 2000;¹⁶⁶ and it planned to use the A.C.E. results to adjust the Census 2000 counts for nonapportionment purposes, including redistricting.¹⁶⁷ However, the agency noted that it:

. . . [would not] release corrected [statistically adjusted] redistricting data until it had brought its technical judgment to bear in assessing the available data to verify that its expectations . . . [had] been met. [It would] . . . consider operational data to validate the successful conduct of the A.C.E., *assess whether the A.C.E. measurements of undercount are consistent with historical patterns of undercount and independent Demographic Analysis benchmarks* [emphasis added] and review measures of quality. . . . If the Census Bureau determine[d] that incorporating the results of the survey would not improve the accuracy of the initial census counts, then the uncorrected data would be denominated as the P.L. 94-171 [redistricting data] file.¹⁶⁸

DA used to assess the housing unit counts from Census 2000. At a November 22, 2000, meeting of the Executive Steering Committee on Accuracy and Coverage Evaluation Policy (ESCAP),¹⁶⁹ the Census Bureau's Population Division staff presented DA housing unit benchmarks to assess the housing unit counts from a preliminary version of the 100 percent census unedited file (HCUF).¹⁷⁰ This version of the HCUF excluded almost all of the more than 2.4 million potential duplicates flagged for deletion, revealing that the preliminary housing unit count from the census was 0.4 percent below the demographic benchmark estimate.¹⁷¹

The final 100 percent census edited file (HCEF),¹⁷² which included housing unit status imputations and the reinstatement of approximately 1 million of the potential address deletions,¹⁷³ became available for analysis by the ESCAP in mid-December 2000, revealing that the national DA housing unit benchmark indicated a 0.4 percent housing unit *overcoverage*.¹⁷⁴

¹⁶⁴ The Housing Unit unduplication program is discussed in more detail in the "Headquarters Processing" section of Chapter 6, "Data Capture and Processing." In that discussion, it is referred to as the "duplicate delete operation."

¹⁶⁵ Ibid.

¹⁶⁶ In his decision against statistical adjustment of the 1990 census counts, Secretary of Commerce Mosbacher cited "important and puzzling differences" between the 1990 DA and post-enumeration survey (PES) estimates as bringing into question the accuracy of the adjusted data. (*Federal Register*, Vol. 56, No. 140 [July 22, 1991], p. 33587.) Census Bureau staff, on the other hand, concluded that these differences were ". . . explainable as within the bounds of DA uncertainty." (*Federal Register*, Vol. 66, No. 46 [March 8, 2001], p. 14013.)

¹⁶⁷ Legal challenges by opponents of sampling resulted in a 1999 Supreme Court decision (*Department of Commerce v. U.S. House of Representatives*) concluding that the use of statistical sampling (and thus statistical adjustment based on sampling) to produce the state population numbers for apportionment of the U.S. House of Representatives was precluded by the Census Act (Title 13, U.S. Code), specifically Section 195. For more information regarding the decision and its effect on the plans for Census 2000, see "The Debate Over the Use of Sampling" section of Chapter 11, "Legal Issues."

¹⁶⁸ *Federal Register*, Vol. 65, No. 119 (June 20, 2000), p. 38393.

¹⁶⁹ A committee of senior career Census Bureau officials charged with making a recommendation to the Director regarding whether the official redistricting data should incorporate a statistical adjustment based on the A.C.E. results.

¹⁷⁰ The processes used to produce the HCUF are described in the "Headquarters Processing" section of Chapter 6, "Data Capture and Processing."

¹⁷¹ <<http://www.census.gov/dmd/www/Escap.htm>>, p. 239 of the PDF "ESCAP Meetings 7-23."

¹⁷² The creation of this file is also described in the "Headquarters Processing" section of Chapter 6.

¹⁷³ Approximately 1.39 million of the 2.41 million provisional deletions were permanently removed, leaving about 1 million that were reinstated. (Chapter 6, "Headquarters Processing" section, subsection entitled "Duplicate delete operation.")

¹⁷⁴ <<http://www.census.gov/dmd/www/Escap.htm>>, p. 277 of the PDF "ESCAP Meetings 7-23."

ESCAP recommendation and decision on adjustment.¹⁷⁵ The ESCAP concluded its analysis in late February 2001 and issued its report and recommendation on March 1, 2001.¹⁷⁶ The report concluded that “. . . the majority of the evidence indicates . . . the superior accuracy of the adjusted numbers,” but identified a number of concerns and recommended releasing the unadjusted data as the official data for redistricting purposes.¹⁷⁷

This recommendation was based on careful examination of estimates produced by DA and the A.C.E., against the actual census counts. The ESCAP's principal concern related to the fundamental differences between DA and A.C.E. estimates that could not be explained. The estimates differed widely, both for the total national population and for important population groups.

The Census 2000 total population count was 281,421,906, while the A.C.E. estimate was 284,683,782, indicating a net undercount of 1.15 percent. The higher of two DA estimates (the “alternative” DA estimate) was 282,335,711, indicating a net undercount of 0.32 percent; while the initial (“base”) DA estimate revealed a net undercount rate of negative 0.65 percent or a *net overcount* of 1.8 million.¹⁷⁸ These data are presented in tabular format in Table 10-3 below.

In addition to the disparity in total population numbers, the two sets of estimates diverged with respect to certain population groups. For example, DA estimates indicated that net undercount rates for non-Black men and women were lower in Census 2000 than they were in previous censuses, whereas A.C.E. estimates implied no change, or even a slight increase, in the net overcount rate for non-Black adults as a whole.¹⁷⁹

The Census Bureau produced the alternative set of DA estimates because its analysis indicated that the base estimate of the total population underestimated the amount of immigration (specifically, undocumented immigration). Thus, the alternative estimate assumed a near doubling (as compared to the base figure) in the net increase in undocumented immigration over the decade.¹⁸⁰ However, even after this increase, the alternative DA estimate of net undercount for the total population (0.32 percent) remained at odds with the A.C.E. estimate (1.15 percent).

¹⁷⁵ The establishment of the ESCAP and the decision-making process regarding possible adjustment of the redistricting data are discussed in more detail in “The Debate Over the Use of Sampling” section of Chapter 11.

¹⁷⁶ *Federal Register*, Vol. 66, No. 46 (March 8, 2001), pp. 14004–46.

¹⁷⁷ *Ibid.*, p. 14005.

¹⁷⁸ These numbers are for the total resident population (including group quarters). DA produces estimates for the entire population, including the group quarters (GQ) universe, whereas the A.C.E. only provided estimates for the household population. The DA estimates of the Census 2000 GQ universe were similar to the census counts of this population, so the GQ population counts were simply added to the A.C.E. estimates to provide a consistent basis for comparison between the DA and A.C.E. estimates.

¹⁷⁹ “Accuracy and Coverage Evaluation Survey: Demographic Analysis Results,” p. 3.

¹⁸⁰ The estimate of the net increase in this subcomponent went from 2.8 to 5.5 million. *Ibid.*, p. 2.

Table 10-3.

Census Count, Base and Alternative Demographic Analysis (DA) Estimates, and Accuracy and Coverage Evaluation (A.C.E.) Estimate for the U.S. Resident Population: April 1, 2000

(A minus sign denotes a net overcount)

Category	Count or estimate
1. Census count.....	281,421,906
2. DA estimate	
a. Base set.....	279,598,121
b. Alternative set.....	282,335,711
3. A.C.E. estimate.....	284,683,782
Difference from census count:	
4. DA estimate	
a. Base set (=2a-1).....	-1,823,785
b. Alternative set (=2b-1).....	913,805
5. A.C.E. estimate (=3-1).....	3,261,879
Percent difference	
6. DA estimate	
a. Base set (=4a/2a*100).....	-0.65
b. Alternative set (=4b/2b*100).....	0.32
7. A.C.E. estimate (=5/3*100).....	1.15

Notes: The DA estimates for ages under 65 are based on components of population change (births, deaths, legal immigration, and estimates of emigration and undocumented immigration).

The DA estimates for ages 65 and over are based on 2000 Medicare data, adjusted for underenrollment.

DA base set - DA estimates without alternative assumption.

DA alternative set - DA base estimates with alternative assumption that doubles the estimated net number of undocumented immigrants entering during the 1990s.

Source: U.S. Census Bureau, J. Gregory Robinson, "Accuracy and Coverage Evaluation Survey: Demographic Analysis Results," DSSD Census 2000 Procedures and Operations Memorandum Series B-4,* March 12, 2001, Table 3, p 22.

The committee investigated the inconsistencies between the DA and A.C.E. estimates extensively, but could not adequately explain them within the available time.¹⁸¹ It concluded that further investigation was necessary to explain and resolve the discrepancies.

In a March 1, 2001, memorandum to the Secretary of Commerce, the Census Bureau Acting Director noted that he concurred with and adopted the ESCAP's recommendation to not adjust, based on the committee report. He specifically discussed the importance of resolving the inconsistencies between the DA and A.C.E. estimates:

... [t]he June 2000 Feasibility Document contained various references to the importance of demographic analysis and demographic estimates as key components of data and analysis to inform the ESCAP recommendation. This point was reinforced in materials the Census Bureau presented on October 2, 2000, at a public workshop sponsored by the National Academy of Sciences.¹⁸²

On March 6, 2001, the Secretary of Commerce announced his acceptance of the recommendation of both the Acting Director and ESCAP, stating that the unadjusted data would be released as the official redistricting data.¹⁸³

Continued evaluation of the adjusted data and plans for second decision. Following the March 2001 redistricting data adjustment decision, the Census Bureau committed itself to addressing unresolved issues regarding the accuracy of the adjusted data. While the timing of the ESCAP's recommendation regarding use of adjusted data for redistricting purposes was constrained by statutory requirements, the Census Bureau determined that additional time to investigate and possibly resolve its concerns with the adjusted data would permit the agency to consider

¹⁸¹ The Census Bureau determined that the redistricting data adjustment decision had to be made by early March 2001, because of the April 1, 2001, statutory deadline for releasing the Census 2000 redistricting data to the states (13 U.S.C. 141(c)).

¹⁸² *Federal Register*, Vol. 66, No. 46 (March 8, 2001), p. 14004.

¹⁸³ The Secretary's decision is documented in *Federal Register*, Vol. 66, No. 49 (March 13, 2001), pp. 14520-21.

the appropriateness of the use of those data for other purposes, including their possible incorporation in long form (sample) data products, intercensal population estimates, and demographic survey controls. The ESCAP committed itself to a mid-October 2001 deadline for making a recommendation, based on additional research and analyses to be carried out during the summer of 2001, with regard to these other potential uses of the adjusted data.¹⁸⁴

As mentioned earlier, of foremost concern was the need to resolve the discrepancies between the DA and A.C.E. estimates, given that this circumstance was the principal reason for the ESCAP's recommendation against adjustment. The ESCAP identified four possible scenarios for the discrepancies:

- (1) The estimates of net undercount from the 1990 census (from DA and from the post-enumeration survey [PES]) may have understated the nation's population, while Census 2000 included at least portions of this unmeasured segment of the population.
- (2) The 2000 DA estimates did not capture the full amount of growth between 1990 and 2000, particularly with regard to the components and subcomponents of international migration (legal, undocumented, and temporary immigration, and emigration).
- (3) Census 2000, as adjusted by the A.C.E., might overstate the nation's population. This could occur because the A.C.E. did not measure census coverage accurately and/or Census 2000 had coverage error pertaining to components not measured by the A.C.E.
- (4) Any combination of the above.¹⁸⁵

The research and analysis conducted during the summer of 2001 required reexamining and reevaluating the Census 2000 counts, the A.C.E. estimates, and the DA estimates. The areas of research with regard to the census counts and A.C.E. estimates are discussed elsewhere, including in the A.C.E. section of this chapter and the ESCAP's Analysis Plan (see footnote 184).

Plans for reexamining the DA estimates.¹⁸⁶ International migration data are associated with high levels of uncertainty. Thus, in preparation for the October decision regarding the use of adjusted data, the Census Bureau, assisted by external demographic experts, focused on these component data of the DA estimates.

Some of the data useful in evaluating these component estimates were not available when Census Bureau staff produced the DA estimates used to assess the March 2001 A.C.E. estimates. For example, data from the Census 2000 Supplementary Survey and the Census 2000 long form questions on citizenship, place of birth, and year of entry provided valuable information for evaluating the international migration component data and revising them as needed.

The "robustness" of the DA methodology offered another avenue of DA research pursued during this time. This called for a reexamination of assumptions underlying the DA components. For example, examination of component data, including historical international migration components by cohort and age/sex groups over time (from 1935 to 2000), provided information about their consistency. The Census Bureau also examined assumptions about the completeness of vital statistics (births and deaths) registration and the coverage of Medicare data. The agency embarked on this work with the understanding that it might result in the recalculation of 1990 census DA estimates, as appropriate, based on the findings of its research and analyses.

Recommendation against adjustment based on high level of A.C.E. error. The ESCAP issued its report and recommendation regarding the possible use of the adjusted data for non-redistricting purposes on October 17, 2001.¹⁸⁷ Once again, it recommended against the use of the adjusted data.

¹⁸⁴ U.S. Census Bureau, "Analysis Plan for Further ESCAP Deliberations Regarding the Adjustment of Census 2000 Data for Future Uses," Executive Steering Committee for Accuracy and Coverage Evaluation Policy, July 26, 2001, p. 1.

¹⁸⁵ *Ibid.*, pp. 1–2.

¹⁸⁶ The information in this subsection is summarized from "Analysis Plan for Further ESCAP Deliberations Regarding the Adjustment of Census 2000 Data for Future Uses," pp. 2–4.

¹⁸⁷ *Federal Register*, Vol. 66, No. 214 (November 5, 2001), pp. 56006–21.

This second round of research and analyses, dubbed “ESCAP II,” confirmed concerns raised earlier regarding the accuracy of the A.C.E. estimates. The studies found that the A.C.E. did not account for a large number of census erroneous enumerations, including many duplicates, leading to an *overstatement of at least 3 million persons* in the initial A.C.E. estimate of Census 2000 net undercount. This finding, in conjunction with revisions made to the DA estimates (resulting in a September 2001 set of DA estimates) that *lowered* the DA-estimated net undercount rate, largely explained the discrepancies between the A.C.E. and DA estimates.¹⁸⁸

Revisions to the DA estimates: results and findings.¹⁸⁹ The revised September 2001 DA estimate for the total population was approximately 576,000 *lower* than the March “alternative” estimate, implying a net undercount estimate of 0.12 percent compared to 0.32 percent for the alternative DA estimate and a net overcount of 0.65 percent for the first March DA figure.

As anticipated, the largest numerical revision to the components of change was an *increase* of approximately 1.38 million for the residual foreign born subcomponent, which primarily reflects undocumented immigration. This increase raised the subcomponent estimate to approximately 10.24 million.¹⁹⁰ However, this revision was more than offset by a decrease of about 880,000 in the estimate of legal immigration and a negative adjustment to the component of birth data of approximately 715,000, based on a revision to assumptions regarding the completeness of birth registrations since 1968.¹⁹¹ Revisions to the components of change also resulted in a revised DA estimate for 1990 census net undercount—that figure was lowered from 1.85 to 1.65 percent.¹⁹²

Thus, there was relatively little change in the DA estimates from the March 2001 alternative DA net undercount estimate of 0.32 percent to the September 2001 estimate of 0.12 percent (or 0.3 million), neither of which agreed with the March A.C.E. net undercount estimate of 3.3 million, or 1.15 percent.

Furthermore, the revised DA estimates continued to differ from the A.C.E. estimates in terms of net undercount rates for non-Black adults (discussed earlier), but both sets of estimates continued to indicate a reduction in the net undercount rates for Black and non-Black children (ages 0 to 17) when compared to 1990. The relevant estimates by race, sex, and age are presented in Table 10-4. DA estimates also continued to indicate a differential undercount of Blacks in comparison to the rest of the population, although the September DA estimates showed a greater narrowing of that difference vis-a-vis the 1990 census than did the March alternative estimates.¹⁹³

As mentioned earlier, DA and A.C.E. sex ratios were compared to determine the presence of correlation bias in the A.C.E. estimates. Correlation bias exists when the act of being included in the census affects the likelihood of inclusion or omission in the A.C.E. Correlation bias is generally expected to be negative; that is, to the extent that correlation bias exists, when people are omitted from the census, there is a greater probability that they will also be omitted from the A.C.E. Simply put, the presence of correlation bias implies that the coverage measurement survey (in this case, the A.C.E.) has underestimated the net undercount. In previous census evaluations, the presence of correlation bias has been acute for the estimates of Black men.¹⁹⁴

¹⁸⁸ Ibid., p. 56007.

¹⁸⁹ The information in this subsection is summarized from U.S. Census Bureau, J. Gregory Robinson, “Demographic Analysis Results,” ESCAP II Report No. 1, October 13, 2001, pp. 2–3.

¹⁹⁰ For a detailed discussion of the methodology used to estimate the foreign-born population and the other international migration components of the revised September 2001 DA estimates, see Appendix A of “Demographic Analysis Results,” ESCAP II Report No. 1.

¹⁹¹ Ibid., p. 8. Table 1 (p. 18) in ESCAP II Report No. 1 shows how the revisions to the March alternative DA component estimates are reflected in the component data for the September revised DA estimate.

¹⁹² Ibid., Table 2, p. 19.

¹⁹³ Ibid. The percentage point differences in the net undercount rates are calculated from the data in this table.

¹⁹⁴ “Accuracy and Coverage Evaluation Survey: Demographic Analysis Results,” DSSD Census 2000 Procedures and Operations Memorandum Series B-4*, p. 15.

Table 10-4.
Estimates of Net Undercount by Race, Sex, and Age: 1990 and 2000
(In percent. A minus sign denotes a net overcount)

Category	Demographic analysis		Survey-based	
	1990 revised	2000 revised	PES 1990	A.C.E. 2000
BLACK MALE				
Total	8.13	5.15	4.90	2.38
0 to 17	5.26	1.06	7.02	2.91
18 to 29	8.22	5.71	3.58	3.85
30 to 49	13.02	9.87	6.29	2.58
50 and over	5.30	3.87	-0.38	-0.67
BLACK FEMALE				
Total	3.05	0.52	4.01	1.78
0 to 17	5.28	1.54	7.07	2.94
18 to 29	3.38	-0.66	5.49	3.76
30 to 49	2.90	1.28	3.20	1.27
50 and over	-0.54	-1.03	-1.22	-0.83
NON-BLACK MALE				
Total	1.55	0.21	1.52	1.39
0 to 17	1.03	0.33	2.46	1.27
18 to 29	1.35	-0.63	3.10	3.38
30 to 49	2.17	0.63	1.30	1.70
50 and over	1.50	0.14	-0.59	-0.20
NON-BLACK FEMALE				
Total	0.62	-0.78	0.85	0.64
0 to 17	1.20	0.77	2.47	1.27
18 to 29	0.16	-1.94	2.36	1.82
30 to 49	0.37	-1.01	0.55	0.90
50 and over	0.69	-1.18	-1.19	-0.75

Note: Estimates by race shown for 2000 are based on the "average" of Model 1 and Model 2 estimates described in the text.

Source: U.S. Census Bureau, J. Gregory Robinson, "Demographic Analysis Results," ESCAP II Report No. 1, October 13, 2001, Table 7, p. 25.

The Census Bureau compared DA and A.C.E. sex ratios within age/race categories to develop estimates of correlation bias in the A.C.E. figures. For example, an A.C.E. sex ratio for Blacks ages 18 to 29 substantially lower than the DA ratio for that group implied a failure by the A.C.E. to capture the full extent of the undercount of Black males in that age group relative to their female counterparts. Implicit in this analysis was the assumption of negligible correlation bias for adult females. Because sex ratios were compared for adult age groups only, it also assumes no correlation bias among children.

Comparisons of the sex ratios for the September 2001 DA and A.C.E. estimates revealed significant correlation bias in the A.C.E. estimates for adult Black males (ages 18 to 29, 30 to 49, and 50 and over), and small levels of such bias in the A.C.E. estimates for non-Black males ages 30 to 49 and 50 and over.¹⁹⁵ The Census Bureau also found that the estimates of correlation bias based on the September DA estimates were:

- For the most part, little changed from the bias estimates obtained from the March base and alternative DA figures.
- Generally similar to correlation bias estimates calculated for the 1990 PES, with the two sets of estimates being particularly close for Black males ages 18 to 29 and 30 to 49.¹⁹⁶

¹⁹⁵ U.S. Census Bureau, William R. Bell, "Estimation of Correlation Bias in 2000 A.C.E. Estimates Using Revised Demographic Analysis Results," ESCAP II Report No. 10, October 16, 2001, p. 1.

¹⁹⁶ Ibid., p. 2. The actual estimates are reported in Table 5, p. 17.

Adjustment decision and release of limited revised A.C.E. estimates. Following adoption of ESCAP's October 2001 adjustment recommendation, the Census Bureau's Acting Director informed the Commerce Department's under secretary for economic affairs that the Census Bureau would release Census 2000 sample data products, intercensal estimates, and survey controls using unadjusted data.¹⁹⁷ He said that extensive additional review and analyses were needed to revise the adjusted data to permit their use for any purposes. He also noted that such work might result in revised A.C.E. estimates that could be used for programmatic purposes such as improving the accuracy of intercensal estimates in subsequent years.

At an October 17 press conference, the Census Bureau's Acting Director announced the agency's decision against adjustment. In order to fully explain the decision, he released "revised early approximations" of net undercount in Census 2000 from the A.C.E. for three race/ethnicity groupings and the total population. The Acting Director provided these estimates to illustrate the effect on A.C.E. estimates of potential future revisions that accounted for the erroneous enumerations not measured by the A.C.E. The estimates were not part of the ESCAP's October 17, 2001 report. The revised estimates were calculated by subtracting the percent of erroneous enumerations not detected by the A.C.E. survey from the original A.C.E. percent net undercount estimates contained in the March 1, 2001 ESCAP report.¹⁹⁸ These preliminary revised estimates are provided in Table 10-5 below. The reduction in the measured net undercount as measured by the revised estimates is quite large (from 1.18 to 0.06 percent). The Acting Director assured stakeholders that the Census Bureau would continue to evaluate the A.C.E. program and attempt to finalize revised estimates for programmatic uses.

Table 10-5.
Revised Preliminary Estimates of Net Undercount: October 17, 2001

(In percent. A minus sign denotes a net overcount)

Category	A.C.E. ¹		Revised early approximation	
	Percent	Standard error	Percent	Standard error
Total	1.18	0.13	0.06	0.18
Non-Hispanic Black	2.17	0.35	0.78	0.45
Hispanic	2.85	0.38	1.25	0.54
All others	0.73	0.14	-0.28	0.20

¹ These March 2001 A.C.E. estimates of percent net undercount pertain to the household population.

Source: Table reproduced in part from press kit materials for the following news release: U.S. Department of Commerce, "Statement of Acting Census Bureau Director William Barron Regarding the Adjustment Decision," *U.S. Census Bureau News*, October 17, 2001, CB01-CS.08.

A.C.E. Revision II work conducted; revised estimates produced. To determine if revised A.C.E. estimates could be improved enough to be used for programmatic purposes, the Census Bureau embarked on a comprehensive research effort dubbed "A.C.E. Revision II." Specifically, the agency planned to investigate producing revised estimates and to determine if utilizing those estimates to adjust the base (that is, the Census 2000 counts) used to produce intercensal population estimates¹⁹⁹ would improve the accuracy of the annual and biennial estimates, in particular, by reducing the differential coverage error in the Census 2000 data.

The A.C.E. Revision II work that the Census Bureau completed in March 2003 resulted in a set of revised estimates of net coverage error in Census 2000 and evaluations of the accuracy of those estimates. The A.C.E. Revision II estimate of percent net undercount for the total household population in Census 2000 was a negative 0.49, or a national net overcount of approximately one-half

¹⁹⁷ *Federal Register*, Vol. 66, No. 214, p. 56006.

¹⁹⁸ John H. Thompson, Preston J. Waite, and Robert E. Fay, "Basis of 'Revised Early Approximation' of Undercounts Released Oct. 17, 2001," ESCAP II Report No. 9a, October 26, 2001.

¹⁹⁹ Intercensal population estimates are produced annually for the nation, states, and counties (and biennially for smaller geographic areas), and they are generally used in federal funding-allocation formulae in lieu of decennial census figures (except for the year in which the census figures are released) because they reflect ongoing population changes during the decade.

of one percent.²⁰⁰ The estimated net undercount rates for non-Hispanic Whites and non-Hispanic Blacks were -1.13 percent and 1.84 percent, respectively, while the net undercount estimates for all other major race/ethnicity groups were not statistically different from zero.²⁰¹ Table 10-6 contains the A.C.E. Revision II estimates for the major race/ethnicity groups. In addition to national-level revised estimates of percent net undercount for major race/ethnicity, tenure, and age/sex groupings, the Census Bureau produced and released revised estimates for states, counties, and places.

Table 10-6.
A.C.E. Revision II Estimates of Percent Net Undercount: March 12, 2003
(In percent)

Estimation grouping	Net undercount	Standard error
Total	-0.49	0.20
RACE AND HISPANIC ORIGIN		
American Indian and Alaska Native (on reservation)	-0.88	1.53
American Indian and Alaska Native (off reservation)	0.63	1.35
Hispanic Origin (of any race)	0.71	0.44
Black or African American (not Hispanic)	1.84	0.43
Native Hawaiian and Other Pacific Islander	2.12	2.73
Asian (not Hispanic)	-0.75	0.68
White or Some Other Race (not Hispanic)	-1.13	0.20

Notes: All net undercounts are for the household population.
A negative net undercount denotes a net overcount.
The A.C.E. Revision II estimates of percent net undercount incorporate an adjustment for correlation bias using the "Two-Group" model.
Source: U.S. Census Bureau, "Decision on Intercensal Population Estimates," March 12, 2003, Table 3 (table reproduced in part), p. 10.

A.C.E. Revision II estimates incorporate adjustment for correlation bias. For the first time, the Census Bureau incorporated an adjustment for correlation bias into estimates produced by dual system estimation. With the revised preliminary estimates (from October 2001) indicating a net undercount close to zero, the Census Bureau realized that considering a correlation bias adjustment would be important because, depending on the level of correlation bias, dual system estimates without the correlation bias adjustment might move the estimates further from the true population total, and therefore they could actually have greater error relative to unadjusted census counts. The A.C.E. Revision II estimate of percent net undercount for the total household population without the adjustment for correlation bias was a negative 1.12 percent, as compared to negative 0.49 percent when the adjustment was incorporated.²⁰² That is, the estimate of net overcount was adjusted downward (brought closer to zero) to account for the bias. The effect of the correlation bias adjustment on the A.C.E. Revision II estimates of net undercount for the major race/ethnicity groups can be seen in Table 10-7.

²⁰⁰ U.S. Census Bureau, "Decision on Intercensal Population Estimates," March 12, 2003, p. 2 (PDF version).

²⁰¹ Ibid.

²⁰² "Decision on Intercensal Population Estimates," Table 3, p. 10.

Table 10-7.

Net Undercount Rates for Major Groups by Model Used to Correct for Correlation Bias: March 12, 2003

(In percent)

Estimation grouping	Estimate without correlation bias adjustment (standard error)	A.C.E. Revision II estimate using two-group model (standard error)
Total	-1.12 (0.20)	-0.49 (0.20)
RACE AND HISPANIC ORIGIN		
American Indian and Alaska Native (on reservation)	-1.16 (1.53)	-0.88 (1.53)
American Indian and Alaska Native (off reservation)	0.30 (1.35)	0.62 (1.35)
Hispanic origin (of any race)	0.42 (0.44)	0.71 (0.44)
Black or African American (not Hispanic)	-0.53 (0.41)	1.84 (0.43)
Native Hawaiian and Other Pacific Islander	1.81 (2.73)	2.12 (2.73)
Asian (not Hispanic)	-1.12 (0.68)	-0.75 (0.68)
White or Some Other Race (not Hispanic)	-1.53 (0.20)	-1.13 (0.20)

Notes: All net undercounts are for the household population. A negative net undercount denotes a net overcount.

Source: "Decision on Intercensal Population Estimates," Table 3 (table reproduced in part), p. 10. Results from the other models appear in the referenced Table 3, but are not shown here.

The A.C.E. Revision II estimate of net undercount for the total resident population—adjusted for correlation bias—was negative 0.48 and was considered within the range of uncertainty surrounding the September 2001 DA estimate of 0.12 percent.²⁰³ However, the Census Bureau had concerns about whether the model chosen for allocating the correlation bias for adult males to specific post-strata within the age/race groups was the most appropriate model for doing so. The Census Bureau noted that the different models it considered produced different subnational results. Additionally, given the relatively low net undercount rate for Hispanics—even with the adjustment for correlation bias—the Census Bureau was uncertain about the level of error associated with the estimate of correlation bias for this population group.

A comparison of the A.C.E. Revision II estimates with and without the correlation bias adjustment to the September 2001 ("revised") DA estimates show that the male/female and Black/non-Black net undercount differentials for the estimates with the adjustment were increased and brought closer to the differentials calculated from the DA estimates, as compared to the A.C.E. Revision II estimates without the adjustment. This outcome was expected, given that the correlation bias adjustment was based on the "expected" DA sex ratios for the Black and non-Black populations.²⁰⁴

However, the A.C.E. Revision II estimates and the revised DA estimates of net undercount were quite different with regard to children ages 0 to 9. DA estimated a relatively large net undercount of 2.56 percent for this group, while the A.C.E. Revision II estimate was not statistically different from zero.²⁰⁵ The DA estimate for this group was produced principally from administrative data on births since the previous census and was considered to be quite accurate. This raised questions about this particular A.C.E. Revision II estimate and possibly about the methodology in general.

²⁰³ Ibid., p. 6. Note that this A.C.E. Revision II estimate is different than that given in Tables 10-6 and 10-7 because it is for the resident population (that is, it includes people in group quarters).

²⁰⁴ U.S. Census Bureau, J. Gregory Robinson and Arjun Adlakha, "Comparison of A.C.E. Revision II Results with Demographic Analysis," DSSD A.C.E. Revision II Memorandum Series PP-41, December 31, 2002, pp. 4-5.

²⁰⁵ "Decision on Intercensal Population Estimates," p. 7.

Census Bureau decides against use of A.C.E. Revision II estimates. While the Census Bureau noted that A.C.E. Revision II estimates represented the most accurate assessment available of Census 2000 coverage, it also noted technical concerns regarding the limitations of the methodology and the quality of the data. In addition to the issues discussed above, the Census Bureau identified other areas of uncertainty with regard to the accuracy of the estimates.²⁰⁶ All of these concerns led the Census Bureau to conclude that the official Census 2000 results would remain the base for producing the intercensal estimates.²⁰⁷

Implications for the 2010 Census. The A.C.E. Revision II research reaffirmed the Census Bureau's confidence in the decisions made in March and October of 2001 to release only the unadjusted data and confirmed that releasing the adjusted data would have been a grave error. As with the earlier ESCAP processes—in particular the March 2001 redistricting data adjustment recommendation—DA played a key role in assessing the coverage measurement survey-based estimates and in doing so underscored its importance as a valuable, essentially independent measure of net census coverage. The Census Bureau will build upon the successes of the use of DA in Census 2000 to ensure a continued reliance upon its strengths as a tool for evaluating, as well as assisting in the planning and development of, the decennial census.

²⁰⁶ For an in-depth assessment of the A.C.E. Revision II estimates and the associated technical concerns, see U.S. Census Bureau, Donna Kostanich, "Technical Assessment of A.C.E. Revision II," DSSD A.C.E. Revision II Memorandum Series, PP-61 March 12, 2003.

²⁰⁷ "Decision on Intercensal Population Estimates," p. 1. The Census Bureau has made publicly available a vast amount of documentation related to its decision and the A.C.E. Revision II research. The following Web page provides access to this documentation: <www.census.gov/dmd/www/ace2.html>.

Chapter 11.

Legal Issues

INTRODUCTION	517
LEGISLATION	517
Title 13, U.S. Code	517
Congressional Oversight and Appropriations Activities	518
Public Laws Concerning Census 2000	519
Public Law (P.L.) 102-135, Decennial Census Improvement Act of 1991	519
P.L. 103-430, Census Address List Improvement Act of 1994	520
P.L. 104-193, Personal Responsibility and Work Opportunity Reconciliation Act of 1996	520
P.L. 105-119, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998	521
Census Legislative Initiatives That Did Not Result in Public Laws	523
Amending Title 13 with regard to the use of sampling	523
Sampling for nonresponse follow-up	523
Racial and ethnic classifications	524
Questionnaire content items	524
English as official language	524
Postcensus local review	525
Census Monitoring Board (CMB)	525
Promotion and outreach	525
Overseas Americans	526
Stateside and overseas military	526
Counting prisoners	526
THE DEBATE OVER THE USE OF SAMPLING	527
1995 to 1997	527
May 1995: Census Bureau Produces Reengineered Census Plan	527
October 1995: Four Strategies Unveiled at Congressional Hearing	527
February 1996: Official "Roll-Out" of the Reengineered Census Plan; Congressional Hearing to Review the Plan	528
September 1996 to February 1997: House Report Airs Views on Sampling; Census Bureau Response	528
March 1997: Bills Introduced to Amend Title 13 With Regard to the Use of Sampling	529
Summer 1997: Fiscal Year 1997 Appropriations Legislation Relating to Census 2000	530
November 1997: Compromise Reached in Enacted FY 1998 Appropriations Bill	530
1998	531
February 1998: Lawsuits Filed to Prevent the Use of Sampling to Produce the Census 2000 Apportionment Counts	531
Fall 1998: FY 1999 Appropriations for Census 2000 Preparatory Activities	531
1999	532
January 1999: Supreme Court Decision and Administration Interpretation	532
Late February 1999: Release of "Updated Summary: Census 2000 Operational Plan"	533
April 1999: Census Bureau Releases Dress Rehearsal Data on Net Coverage Error by Race and Ethnicity	533
Early May 1999: National Academy of Science (NAS) Panel Commends Census Bureau Methodological Work on the A.C.E.	534
May 1999: Budget Agreement Reached	534
Early June 1999: Administration Sends Congress Revised FY 2000 Budget Request for Census 2000	535

CONTENTS

August 1999: House Approves Nearly \$4.5 Billion for Census 2000 in FY 2000; Designates the Full Amount as Emergency Spending	535
October to Late November 1999: Census Bureau Must Operate Under Series of Continuing Resolutions Until Omnibus Spending Measure Is Enacted Into Law.	535
December 1999: Census Bureau's Executive Steering Committee for Accuracy and Coverage Evaluation Policy Holds First Meetings	536
2000	536
June 2000: Department of Commerce Issues Proposed Rule	536
October 2000: Department of Commerce Issues Rule in Final Form	537
November 2000: NAS Panel Provides Feedback on Proposed Analyses to Inform the ESCAP Recommendation	537
2001	537
February 2001: Census Bureau Releases Preliminary A.C.E. Estimated Ranges of Net Coverage Error in Census 2000	538
February 2001: Commerce Secretary Rescinds Census Bureau Director's Authority to Make Adjustment Decision and Issues New Rule Governing Process.	538
Late February 2001: City of Los Angeles and Others File Lawsuit Challenging Secretary's Revocation of the Delegation of Authority	538
Early March 2001: ESCAP Recommends Against Statistical Adjustment; Acting Director and Secretary Concur With and Adopt Committee Recommendation	539
March to April 2001: Following the Adjustment Decision, Numerous Calls for the Release of the Adjusted Data	540
April 2001: Members of Congress Request Adjusted Block-Level Data Under the "Seven Member Rule"	540
Late April 2001: Utah Files Suit Challenging the Use of Count Imputation	541
September 2001: Census Monitoring Board Issues Two Separate Final Reports to Congress.	541
September 2001: Acting Director Discusses Plans to Make a Decision Regarding Possible Nonredistricting Uses of the Adjusted Data	542
Mid-October 2001: Further Research Confirms Errors in Adjusted Data Results	543
Mid-October 2001: Census Bureau Adopts ESCAP Recommendation Against Adjustment; Releases Limited Revised Estimates of Census 2000 Net Undercount.	543
2002	544
January to May 2002: District Court Orders Release of Adjusted Data Pursuant to the "Seven Member Rule" and Denies Reconsideration Motion; Commerce Department Appeals Decision	544
Early April 2002: Census Bureau Releases Revised Preliminary Estimates of Net Undercount for Seven Race/Ethnicity Groupings	544
September 2002: Ninth Circuit Court of Appeals Upholds District Court Decision in City of Los Angeles Suit	545
October to December 2002: Ninth Circuit Court Upholds District Court FOIA Ruling; Census Bureau Makes Adjusted Data Available to Any Requester	545
2003	546
March 2003: Census Bureau Produces Revised A.C.E. Estimates, But Decides That Intercensal Estimates Will Continue to Use Unadjusted Census 2000 Base	546

CONTENTS

FREEDOM OF INFORMATION ACT REQUESTS	550
The Freedom of Information Act	550
The Census Bureau and the FOIA	550
Requests Pertaining to Adjustment Issues	550
Background	550
Requests related to the adjustment methodology and decision-making process	551
Requests for release of the adjusted data	551
Requests Pertaining to Nonadjustment-Related Programs or Operations	552
Requests related to programs/operations legally challenged by the State of Utah	552
Requests by the City of Los Angeles relating to the Census 2000 service-based enumeration (SBE)	553
Other requests pertaining to nonadjustment-related programs or operations	554
Requests Regarding Decennial Personnel Issues or Contracts	554
Requests pertaining to decennial personnel issues	554
Requests for documents relating to decennial census contracts	554
LITIGATION	555
1990 Census Litigation	555
<i>Wisconsin v. City of New York</i>	555
<i>National Law Center on Homelessness and Poverty v. Kantor</i>	559
<i>Slattery v. Clinton</i> (originally filed as <i>Lanoue v. Clinton</i>)	561
Census 2000 Litigation	562
<i>Clinton v. Glavin and Department of Commerce v. U.S. House of Representatives</i>	562
<i>Utah v. Evans (Evans I)</i>	566
<i>Utah v. Evans (Evans II)</i>	568
<i>City of Los Angeles v. Evans</i>	576
<i>U.S. Department of Commerce v. Carter</i>	578
<i>Waxman v. Evans</i>	579
<i>Cameron County, Texas v. Evans</i>	580
<i>Assyrian National Congress of America v. Bureau of the Census</i>	583
<i>Morales v. Evans</i>	584
<i>Lindsey v. Prewitt</i>	586
<i>Cahoon v. Bureau of the Census</i>	586
<i>Barnett v. U.S. Department of Commerce</i>	587
<i>City of Los Angeles v. U.S. Department of Commerce</i>	588
Other litigation	588

Chapter 11: Legal Issues

INTRODUCTION

This chapter is divided into four sections. The first is a summary of key legislative activities, including laws enacted that affected the planning and/or conduct of Census 2000. The section on legislation is followed by a chronology of events in the national debate over the use of sampling. The third section is a discussion of noteworthy Freedom of Information Act requests pertaining to various aspects of the census. Finally, the chapter concludes with summaries of lawsuits challenging the planning, conduct, or results of Census 2000.

LEGISLATION

The U.S. Constitution empowers the Congress to carry out the census in “such manner as they shall by Law direct” (Article I, Section 2). Congress passed special acts for the first 14 censuses (1790 to 1920), with detailed provisions about how to take the census and the questions to include. In 1929 Congress passed an act under which the 1930 decennial census was taken. This act limited the categories of inquiries to population, agriculture, irrigation, drainage, distribution, unemployment, and mines, but gave the Director of the U.S. Census Bureau—with approval of the U.S. Secretary of Commerce—discretion in determining the specific questions and procedures. The 1940 and 1950 censuses were governed by modifications to the 1929 act and by later legislation that provided for the census of housing and the periodic census of governments. In 1954, Congress codified these and all other statutes authorizing the decennial census and other censuses and surveys conducted by the Census Bureau as Title 13, U.S. Code.¹ Title 13 was amended several times over the ensuing years, and it governed Census 2000.

This section reviews key provisions of Title 13, other public laws concerning Census 2000, proposed census legislation that did not become law, and congressional oversight and appropriations activities.

Title 13, U.S. Code

Title 13, U.S. Code, does not specify which subjects or questions are to be included in the decennial census. However, it does require the Census Bureau to notify Congress of general census subjects to be addressed 3 years before the decennial census and the actual questions to be asked 2 years before the decennial census. The law also directs that state population counts for apportionment purposes be delivered to the President of the United States within 9 months of Census Day (April 1 of the year in which the census is taken). Counts must be delivered to the states for use in redistricting within 12 months of Census Day.

Title 13 requires individuals to complete (or provide information for) the census questionnaire and participate in other phases of the census as the Census Bureau deems necessary. These other activities could include providing information about a housing unit’s address and number of living quarters, participating in test and dress rehearsal censuses, answering decennial census-related research surveys, or responding to postcensus questionnaires used to evaluate decennial census coverage. Section 221, Title 13, U.S. Code, provides that anyone 18 years of age or older who willfully neglects or refuses to answer the census may be fined up to \$100. Anyone who knowingly gives false answers is subject to a fine of \$500. The maximum amount of these fines was increased to \$5,000 by the Sentencing Reform Act of 1984.²

¹ To access the U.S. Code online, go to <<http://uscode.house.gov/>>.

² Title 18, U.S. Code, Section 3571 (18 U.S.C. § 3571) (2005).

Title 13 also mandates strict confidentiality of the information gathered.³ Section 9(a) states in part:

Neither the Secretary, nor any other officer or employee of the Department of Commerce or bureau or agency thereof, or local government census liaison, may . . . (1) use the information furnished under the provisions of this title for any purpose other than the statistical purposes for which it is supplied; or (2) make any publication whereby the data furnished by any particular establishment or individual under this title can be identified; or (3) permit anyone other than the sworn officers and employees of the Department or bureau or agency thereof to examine the individual reports.

Every permanent and temporary employee of the Census Bureau takes an oath to protect the confidentiality of census information. Title 13 states that employees are subject to a fine of up to \$5,000 and/or 5 years of imprisonment for wrongful disclosure; however, the Sentencing Reform Act increased the maximum fine for unlawful disclosure to \$250,000.⁴

Individual census records are preserved by the National Archives and Records Administration (NARA) pursuant to law—Title 44, U.S. Code, Section 2108—and made confidential under that same law for 72 years after collection. After that period, NARA may open them to the general public for genealogical and other uses.⁵ However, many people have to rely on later records (that is, 1940 on) of their ancestors' or their own census answers to prove age, residency, and/or identity. The Census Bureau (under the authority of Title 13, U.S. Code, Section 8(a)) may, upon written request, release information from these records, but only to the persons named in the record. The records of deceased persons may be made available, upon proof of their death, only to their heirs, legal beneficiaries, or authorized representatives.⁶

Congressional Oversight and Appropriations Activities

At the beginning of the decade prior to Census 2000 (1991–92, the 102nd Congress), the Census Bureau came under the jurisdiction, for oversight purposes, of the House Committee on Post Office and Civil Service's Subcommittee on Census and Population. On the Senate side, the Governmental Affairs Subcommittee on Government Information and Regulation oversaw the Census Bureau. For the 103rd Congress (1993–94), the House Subcommittee was renamed the Subcommittee on Census, Statistics, and Postal Personnel, and the Senate Subcommittee was renamed the Subcommittee on Regulation and Government Information.

In the 104th Congress (1995–96), there was a reorganization affecting many committees, including those that previously had oversight responsibility for the Census Bureau. As a result of these changes, the Census Bureau was placed under the jurisdiction of the Subcommittee on National Security, International Affairs, and Criminal Justice of the Committee on Government Reform and Oversight in the House. It remained under the purview of the Committee on Governmental Affairs in the Senate; however, there was no longer an oversight subcommittee on census issues (this applied throughout the remainder of the 2000 Census cycle). During the first session of the 105th Congress (1997–98), the House removed Census Bureau oversight responsibility from the Subcommittee on National Security, International Affairs, and Criminal Justice, and through a resolution, created a new "Census Subcommittee" under the Committee on Government Reform and Oversight to assume jurisdiction solely over the decennial census and other Census Bureau programs. With the start of the 106th Congress in 1999, the name of the House oversight committee

³ 13 U.S. Code § 9 (1990 & Supp. 2006); in 1994, the Congress amended Title 13 to permit the Census Bureau to share address information with state and local governments for the sole purpose of updating address lists to be used in carrying out censuses and surveys authorized therein. State and local officials are legally banned from using this address information for noncensus purposes, such as taxation or law enforcement. Section 9(a) of Title 13 was further amended in 1997 by provisions of the Department of Commerce's fiscal year (FY) 1998 appropriations act creating a Census Monitoring Board to observe and monitor all aspects of the preparation and implementation of the 2000 decennial census. These provisions specifically grant members of this board access to confidential census information in the course of their official duties. For a more detailed discussion of these statutes, see the section entitled "Public Laws Concerning Census 2000."

⁴ 13 U.S.C. § 214 (1990 & Supp. 2006), as amended by 18 U.S.C. § 3571 (b)(3) (2005).

⁵ 44 U.S.C. § 2108 (2006).

⁶ Title 15, Code of Federal Regulations, Section 80.3 (2006).

was shortened to Committee on Government Reform. The House Subcommittee on the Census was in operation from 1998 through 2001. During 2002, the second session of the 107th Congress, the Subcommittee on the Census was abolished and jurisdiction was given to the Subcommittee on Civil Service, Census, and Agency Organization.

The Government Accountability Office (GAO)⁷, an investigative arm of the Congress, observed and evaluated Census Bureau activities throughout the entire Census 2000 cycle. Often, GAO's reports to the relevant committees were presented at oversight hearings. From 1991 to 2003, the GAO issued more than 60 reports and testimonies relating to various aspects of the planning, conduct, and results of Census 2000.⁸

In the House of Representatives, the Census Bureau's appropriations were handled by the Subcommittee on Commerce, Justice, State, the Judiciary, and Related Agencies. This subcommittee was a component of the House Committee on Appropriations. In the Senate, the agency's appropriations came before the Subcommittee on Commerce, Justice, State, and the Judiciary of the Committee on Appropriations. Money to operate federal agencies must be appropriated annually, so, generally, for each year in the Census 2000 cycle, a new law appropriated funds for the Census Bureau's operations.

One of the most important functions of any congressional oversight committee is to hold open congressional hearings to get progress reports from the agencies under its jurisdiction, as well as obtain input from other interested parties. During the period from 1991 to 2001, oversight committees or subcommittees held 57 hearings related to Census 2000. Nearly three-quarters of these were before the subcommittee of the House of Representatives with specific oversight of Census Bureau programs. Topics of the congressional hearings included issues related to the planning (including research and testing), implementation, and evaluation of Census 2000. (See Appendix F for a list of these hearings.)

Public Laws Concerning Census 2000

Public Law (P.L.) 102-135, Decennial Census Improvement Act of 1991 (October 24, 1991). Largely as a response to controversy and criticism pertaining to the 1990 census, Rep. Thomas Sawyer (D-OH), chairman of the oversight subcommittee of the House of Representatives, introduced a bill during the first session of the 102nd Congress to study ways to improve the decennial census.⁹ As enacted into law, the legislation required the Secretary of Commerce to contract with the National Academy of Sciences (NAS) to study ways for the government to (1) achieve the most accurate population count possible and (2) collect other demographic and housing data.

Specifically, the law required the NAS to study population data to consider: (1) ways to improve the government's enumeration methods; (2) alternative methods for collecting the data needed for a basic population count, including the use of administrative records; and (3) the appropriateness of using sampling methods, together with basic data collection techniques or otherwise, in obtaining or refining population data.

The law further required the NAS to study demographic and housing data to consider (1) the degree to which a continuing need is anticipated for the types of data (other than the bare minimum necessary to conduct a basic head count) collected in the previous decennial census and (2) if such a need were determined, whether more effective ways to collect the information using traditional methods were available, and whether alternative sources or methodologies existed or could be implemented to obtain the information in a timely manner.

Finally, it mandated that the NAS issue a final report, within 36 months, that would include (1) an evaluation of the relative advantages and disadvantages, as well as an analysis of the cost effectiveness, of each alternative and (2) an analysis of the potential effects on privacy and public confidence in, and the integrity of, a census derived from an alternative not involving the direct collection of data from individuals.

⁷ In July 2004, Public Law 108-271 formally changed the name from General Accounting Office.

⁸ Included in this tally are GAO reports and testimonies where Census 2000 issues were examined as part of a Commerce Department-wide or federal agency-wide evaluation.

⁹ H.R. 3280, Decennial Census Improvement Act of 1991, became P.L. 102-135 on October 24, 1991. *Congressional Record*, October 25, 1991, p. D1314.

A separate bill that provided FY 1992 appropriations for the Department of Commerce included \$1.4 million in the Periodic Censuses and Programs account to fund the NAS study.¹⁰

Earlier that same year, Rep. Harold Rogers (R-KY), the ranking minority member of the House appropriations subcommittee pertaining to the Department of Commerce, introduced a bill similar to Rep. Sawyer's that would have required the department to enter into a contract with the NAS to study the decennial census.¹¹ Rep. Rogers' bill included a \$1.4 million appropriation to pay for the study. No action was taken on this bill.

In December 1994, the Panel on Census Requirements in the Year 2000 and Beyond, an entity of the NAS's National Research Council, issued its final report. The panel was convened pursuant to P.L. 102-135.¹²

P.L. 103-430, Census Address List Improvement Act of 1994 (October 31, 1994). During the second session of the 103rd Congress, Rep. Sawyer, still chairman of the House oversight subcommittee, sponsored legislation that amended Title 13 to permit the sharing of census address information with state and local governments in order to develop complete and accurate address lists to be used in carrying out censuses and surveys.¹³

The law required the Secretary of Commerce to publish standards for the address information that local governments might submit for use in the development of census address lists and to develop and publish a timetable for the Census Bureau to receive, review, and respond to submissions. It required the Secretary to provide locally appointed census liaisons who would have access to census information with an explanation of their duties and obligations, including upholding the confidentiality of the data, and the penalties they would incur for wrongful disclosure under Title 13, U.S. Code (the Census Act). In addition, this law amended Sections 9 and 214 of the Census Act, specifically subjecting census liaisons to confidentiality requirements and wrongful disclosure penalties except in performance of their official duties as authorized in Section 16 of Title 13, U.S. Code. The law also mandated that the Office of Information and Regulatory Affairs at the U.S. Office of Management and Budget develop an appeals process for state and local governments desiring to appeal Census Bureau address determinations.

Additionally, P.L. 103-430 amended Section 412 of Title 39, U.S. Code, and required the U.S. Postal Service to provide any address and address-related information to the Census Bureau that was deemed appropriate by both entities for use in any census or survey conducted by the agency.

P.L. 104-193, Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (including Grandparents as Caregivers, August 22, 1996). Legislation to reform the nation's welfare system that became law during the second session of the 104th Congress contained a provision requiring the Census Bureau to collect decennial and mid-decade data concerning grandparents who are the primary caregivers for their grandchildren.¹⁴ The law specifies that data are to be collected to distinguish between (1) a household in which a grandparent temporarily provides a home for a grandchild for a period of weeks or months during periods of parental distress and (2) a household in which a grandparent provides a home for a grandchild and serves as the primary caregiver for the grandchild.

¹⁰ H.R. 2608, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1992, became P.L. 102-140 on October 28, 1991. *Congressional Record*, October 29, 1991, p. D1331.

¹¹ H.R. 2469 (1991).

¹² The report's publication was the immediate impetus for the Census 2000 "reengineered census" document issued in May 1995. The NAS panel recommended the increased use of sampling in Census 2000 and that the Census Bureau redesign the census by reexamining all facets of the census and providing information to budget and policy decision makers about the consequences of a reengineered census on both the operations and quality of the census. See Chapter 2, "Planning the Census," for further discussion of this and the other NAS panels convened to study and make recommendations regarding the planning, research, and testing for Census 2000.

¹³ H.R. 5084, Census Address List Improvement Act of 1994, became P.L. 103-430 on October 31, 1994. "Acts Approved by the President," *Weekly Compilation of Presidential Documents*, Vol. 30, No. 44, November 7, 1994, p. 2273.

¹⁴ H.R. 3734, Personal Responsibility and Work Opportunity Reconciliation Act of 1996, became P.L. 104-193 on August 22, 1996. *Congressional Record*, September 3, 1996, p. D879.

P.L. 105-119, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998 (including provisions related to the Census Monitoring Board, November 26, 1997).

Soon after the February 1996 official “roll-out” of “The Plan for Census 2000,” a significant number of members of Congress criticized the Census Bureau’s planned uses of sampling in nonresponse follow-up operations and in the Integrated Coverage Measurement program. Debate over the sampling issue postponed passage of the Commerce Department’s FY 1998 appropriations bill until the end of November 1997, 2 months into the new fiscal year. With the threat of a stalemate between the congressional leadership and the Clinton administration in the debate over the use of statistical sampling in Census 2000, the two sides reached a compromise in the enacted legislation.¹⁵

Among other things, the appropriations act provides for a civil remedy (declaratory, injunctive, or any other appropriate relief) to any person adversely affected by the use of an unlawful or unconstitutional “statistical method” in producing the Census 2000, or any later decennial census, apportionment or redistricting data.¹⁶ The act defines an “aggrieved person” as “(1) any resident of a State whose congressional representation or district could be changed as a result of the use of a statistical method challenged in the civil action; (2) any Representative or Senator in Congress; and (3) either House of Congress.”¹⁷ The statute authorizes the Speaker of the House (or his designee) to bring a civil action on behalf of the House of Representatives to prevent use of any statistical method for determining the apportionment or redistricting of members in Congress.

Further, to any entity within the executive branch authorized to conduct a decennial census, the act conferred standing to seek and obtain a declaratory judgment on the legality and constitutionality of the use of statistical sampling in determining the population for purposes of the apportionment or redistricting of members in Congress.

Challenges brought under the provisions of Section 209 were to be heard by a three-judge district court. Decisions by a district court could be appealed directly to the U.S. Supreme Court, and all courts were to expedite review of all challenges.

The legislation guaranteed that sufficient funding would be available for the Census Bureau to “. . . plan, test, and become prepared to implement a 2000 decennial census, without using statistical methods . . .” as an alternative to the original plan, establishing a “dual track” planning process.¹⁸ It further required the Census Bureau to make publicly available “the number of persons enumerated without using statistical methods” for all dress rehearsal data releases and, with regard to Census 2000 itself, for

. . . (2) the data contained in the 2000 decennial census Public Law 94-171 data file released for use in redistricting, (3) the Summary Tabulation File One (STF-1) for the 2000 decennial census, and (4) the official populations of the States transmitted from the Secretary of Commerce through the President to the Clerk of the House used to reapportion the districts of the House among the States as a result of the 2000 decennial census.¹⁹

The law also set up an eight-member Census Monitoring Board (CMB) to observe and monitor all aspects of the planning and implementation of Census 2000. Four members were to be appointed by the majority leadership in Congress and four by the administration. P.L. 105-119 required the

¹⁵ H.R. 2267, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998, became P.L. 105-119 on November 26, 1997. “Statement on Signing the Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998,” *Weekly Compilation of Presidential Documents*, Vol. 33, No. 48, December 1, 1997, p. 1926. The relevant provisions of P.L. 105-119 are contained in Title II, Sections 209 and 210.

¹⁶ P.L. 105-119, Title II, Section 209(h)(1) defines the term “statistical method” as follows: “. . . [A]n activity related to the design, planning, testing, or implementation of the use of representative sampling, or any other statistical procedure, including statistical adjustment, to add or subtract counts to or from the enumeration of the population as a result of statistical inference. . . .”

¹⁷ *Ibid.*, Section 209(d).

¹⁸ *Ibid.*, Section 209(j).

¹⁹ *Ibid.*

CMB to send periodic reports to Congress beginning April 1, 1998, and to issue a final report—containing a detailed statement of its findings and conclusions—by September 1, 2001. These reports were to address, among other things, the Census Bureau’s efforts to conduct the 2000 census:

- To achieve maximum possible accuracy at every level of geography.
- By means of an enumeration process designed to count every individual possible.
- To be free from political bias and arbitrary decisions.²⁰

As mentioned earlier in this section, provisions of the appropriations statute amended Title 13, U.S. Code, to grant members of the CMB access to confidential census information in the course of their official duties.²¹

The President’s statement upon signing H.R. 2267 into law included the following remarks with regard to the provisions concerning judicial review of the use of sampling in the decennial census:

It is my strong conviction, and it is the opinion of the Department of Justice, that sampling complies with both the Constitution and the Census Act . . . [I]n providing for a right of action to challenge the use of sampling before completion of the 2000 Census, the Act does not, nor could it, modify the “immutable requirements” of Article III of the Constitution regarding ripeness and standing to sue. Representatives of my Administration informed the Congress while it was considering the census provisions of their doubts whether the right to sue in the Act satisfies Article III requirements. Opponents of sampling in the 2000 Census will have the opportunity to attempt to persuade the courts that it does, but the Department of Justice is obligated to challenge any suits that fail to meet applicable justiciability requirements.²²

During House consideration of H.R. 2267, Rep. Carolyn Maloney (D-NY) asked the Congressional Research Service (CRS)²³ to analyze the implications of an amendment introduced by Rep. Dennis Hastert (R-IL) and adopted by the House that automatically enjoined the use of appropriated funds for any statistical method upon commencement of a civil action under this law until final adjudication of the legality and constitutionality of such method.²⁴ A day before the House passed H.R. 2267 with the Hastert amendment, the CRS noted that the Congress cannot confer standing (where it otherwise does not exist) on a party to bring suit, and the CRS concluded that it was unlikely any plaintiff could demonstrate any actualized or imminent injury prior to the taking of the census.²⁵

Similarly, language in the Hastert amendment that was later included in the enacted legislation (as noted earlier) authorized the Commerce Department and Census Bureau to obtain a declaratory judgment on the legality and constitutionality of the use of sampling in the decennial census to produce the apportionment and redistricting data. The CRS concluded that the language in question attempted to confer an authority when “[i]t seems doubtful that this authority could be exercised.”²⁶

²⁰ P.L. 105-119, Title II, Section 209(f)(2)(A).

²¹ 13 U.S.C. § 9 (Supp. 2006).

²² “Statement on Signing the Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998,” pp. 1926–27.

²³ The CRS is the public policy research arm of the Congress. Throughout the legislative process, the CRS works exclusively and directly for all members and committees of the Congress to provide them with comprehensive and reliable analysis, research, and information services.

²⁴ The enacted version of H.R. 2267 did not contain this provision. H. Res. 239 (relating to the consideration of H.R. 2267), agreed to by the House on September 24, 1997, provided for the automatic adoption of the amendment offered by Rep. Hastert—contained in the accompanying report (H. Rept. 105-264)—upon agreement to the resolution.

²⁵ Johnny H. Killian, senior specialist, American Constitutional Law, American Law Division, Congressional Research Service, letter-report to Rep. Carolyn Maloney, U.S. House of Representatives, September 29, 1997, p. 7.

²⁶ *Ibid.*

Census Legislative Initiatives That Did Not Result in Public Laws

Note: Unless otherwise stated, no action was taken on these bills after introduction.

Amending Title 13 with regard to the use of sampling. In March 1997, two bills were introduced in the House to “clarify” the language of Title 13, U.S. Code (the Census Act), with regard to the use of sampling to produce the population data used for apportionment. Rep. Maloney introduced a bill that would have amended Section 195²⁷ of Title 13 to provide “unambiguous” language permitting the use of sampling in the decennial census for the purpose of reapportioning the U.S. House of Representatives.²⁸ Meanwhile, Rep. Thomas Petri (R-WI) introduced a bill to amend Section 141 of Title 13 to provide “clear” language prohibiting the use of sampling or other statistical procedure in the census for determining the apportionment counts.²⁹

In response to the January 25, 1999, Supreme Court decision³⁰ that Section 195 of Title 13 prohibits the use of sampling to determine the population data used for apportionment, legislation was introduced in February 1999 to amend Section 195 to permit its use for apportionment purposes. Rep. Maloney introduced her bill on February 3, the same day that Senators Daniel P. Moynihan (D-NY) and Jeff Bingaman (D-NM) introduced a companion bill to amend Title 13 in an identical fashion.³¹

Sampling for nonresponse follow-up. “The Plan for Census 2000” originally called for controlling nonresponse follow-up sampling at the county level, that is, instituting sampling when 90 percent of the households in a county had been enumerated.³² However some members of the Census Bureau’s Race and Ethnic Advisory Committees, most notably those on the African American Advisory Committee, suggested that setting the 90 percent completion requirement at the county level would not be an effective solution. They stressed that, because minority groups composed a significant proportion of the hard-to-enumerate population, some predominantly minority jurisdictions with response rates substantially below the mandatory 90 percent level would still be enumerated at the 1-in-10 sample rate if the county as a whole met this criterion, thus resulting in more minority persons being estimated from the sample than in the nonminority population.³³

In May 1996, Rep. Carrie Meek (D-FL) introduced a bill that would have required the Census Bureau to attempt to contact every household directly (either by mail or in person) but would have allowed the use of sampling as a substitute for direct contact in a particular census tract after direct contact had been made with at least 90 percent of the households in the tract.³⁴

²⁷ 13 U.S.C. § 195, reads as follows: “Except for the determination of population for purposes of apportionment of Representatives in Congress among the several States, the Secretary shall, if he considers it feasible, authorize the use of the statistical method known as ‘sampling’ in carrying out the provisions of this title.”

²⁸ H.R. 1178, Census Accuracy Act of 1997.

²⁹ H.R. 1220, Census, Title 13, U.S.C., Amendment (1997). H.R. 1220 is identical to the bill (H.R. 3589) Rep. Petri introduced in June 1996 (104th Congress) on which no action was taken.

³⁰ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999). A detailed summary of this case is presented in the “Litigation” section of this chapter. In addition, the impact of the decision on the Census Bureau’s plans for conducting Census 2000 is described in the section entitled “The Debate Over the Use of Sampling.”

³¹ H.R. 548 and S. 355, respectively (1999).

³² See Chapter 2, “Planning the Census,” for a detailed discussion of the development of “The Plan for Census 2000.”

³³ U.S. Census Bureau, “Minutes and Report of Committee Recommendations,” meetings of the Census Advisory Committees on the African American, American Indian and Alaska Native, Asian and Pacific Islander, and Hispanic Populations, December 11–13, 1995, pp. 13, 16, 63, and 67.

³⁴ H.R. 3558, Decennial Census Improvement Act of 1996. The bill also would have required the Census Bureau to seek greater involvement of state and local government offices, as well as appropriate local community action groups, in order to reduce the undercount and would have provided legislative exemptions to permit federal annuitants, military retirees, and recipients of federal assistance programs such as Food Stamps and Aid to Families with Dependent Children to earn income from working on Census 2000 without impacting their eligibility for, or amount of, benefits. Identical language on legislative exemptions was included in a bill, H.R. 683, Rep. Meek introduced in February 1999 (106th Congress). An amended version of that bill was approved by the Committee on Government Reform.

As a result of continued discussions with its advisory committees, the Census Bureau decided that it would target 90 percent completion at the census-tract level and estimated that this would increase the projected cost of the census to about \$4 billion.³⁵

Racial and ethnic classifications. In February 1997, in the first session of the 105th Congress, Rep. Petri introduced an amendment to the Paperwork Reduction Act, requiring that respondents be given the opportunity to specify “multiracial” or “multiethnic” in responses to federal data collection instruments containing questions regarding racial or ethnic classification, respectively.³⁶ In October 1997, the Office of Management and Budget announced changes to Statistical Policy Directive No. 15, which governs the federal government collection and reporting of data on race and ethnicity. These changes included allowing the reporting of *more than one* race when self-identification is used, but not the use of a separate “multiracial” category. The revised standards were in effect for both the 1998 Dress Rehearsal and Census 2000. See Chapter 2, “Planning the Census,” for a detailed discussion of the new standards and their implications for the collection of data on race and ethnicity in Census 2000.

Questionnaire content items. In September 1996 and again in June 1997, Rep. Charles Canady (R-FL) introduced bills that would have required the Census Bureau to collect information relating to family caregivers in the 2000 decennial census.³⁷ Rep. Constance Morella (R-MD) and Sen. Robert Torricelli (D-NJ) introduced resolutions in March 1997 expressing the sense of the Congress that an ancestry question be included in Census 2000,³⁸ and in March and April of 1998, they introduced resolutions calling for the inclusion of a long form in Census 2000.³⁹ In July 1998, Rep. Dan Miller (R-FL) introduced a bill calling for Census 2000 to ask questions about the availability of personal computers in the home and access to the Internet.⁴⁰ In October 1999, Congress passed a law that included a nonbinding “Sense of the Senate” that the Census Bureau put the marital status question on the Census 2000 short form.⁴¹ The Census Bureau, which had previously informed Congress of its plans, collected marital status only on the long form in Census 2000.

In reaction to public complaints about the census long form, seven members of the House introduced bills between March and May 2000 to limit census question content and curtail penalties for failure to answer questions beyond those required on the short form. In most of the bills, the basic questions required were limited to names and number of individuals at an address, but in some of the bills, answers to most short-form questions would have been required.⁴² The members who introduced the bills were Representatives Ron Paul (R-TX), Duncan Hunter (R-CA), Nick Smith (R-MI), Mac Collins (R-GA), Helen Chenoweth-Hage (R-ID), Tom Campbell (R-CA), and Lee Terry (R-NE).⁴³

English as official language. Throughout the early- to mid-1990s, several bills were introduced to make English the official language of the United States and require government agencies

³⁵ U.S. Census Bureau, “Minutes and Report of Committee Recommendations,” meetings of the Census Advisory Committees on the African American, American Indian and Alaska Native, Asian and Pacific Islander, and Hispanic Populations, December 5-6, 1996, pp. 1 and 8. In February 1997, Rep. Meek introduced a bill almost identical to the one (H.R. 3558) she had introduced in the 104th Congress. No action was taken on this bill either. On March 11, 1997, the Census Bureau, in testimony before the Senate Governmental Affairs Committee, announced refinements to its plans for nonresponse sampling that entailed utilizing direct sampling to obtain responses from at least 90 percent of all households in each census tract and then sampling 1 in 10 to account for the remaining 10 percent (or less) of households in the tract.

³⁶ H.R. 830, Paperwork Reduction Act, Amendment (1997). Rep. Petri had introduced an identical bill (H.R. 3920) in July 1996 (104th Congress) on which no action was taken.

³⁷ H.R. 4146 (1996) and H.R. 2081 (1997), Family Caregiver Information Act. These bills would have required the collection of more extensive data than that required in the grandparents as caregivers provision of P.L. 104-193 discussed earlier.

³⁸ H.R. Con. Res. 38 (1997) and S. Con. Res. 12 (1997).

³⁹ H.R. Con. Res. 246 (1998) and S. Con. Res. 92 (1998).

⁴⁰ H.R. 4270 (1998).

⁴¹ H.R. 2084, Department of Transportation and Related Agencies Appropriations Act, 2000, became P.L. 106-69 on October 9, 1999.

⁴² The short form requested the following information: name, relationship to householder (a person who rents or owns the unit), sex, age/date of birth, Hispanic origin, and race. The questionnaire also requested the number of residents of the housing unit and whether it was rented or owned. Additionally, the householder was asked to provide his or her telephone number.

⁴³ H.R. 4085, H.R. 4154, H.R. 4158, H.R. 4188, H.R. 4198, H.R. 4291, and H.R. 4458 (2000).

to communicate with the public only in English. Bills introduced in 1996 (H.R. 123) and 1997 (H.R. 123) would have exempted the decennial census from this requirement. In other words, these bills would have allowed the Census Bureau to print decennial questionnaires and promotional materials and conduct other census activities in other languages, but surveys conducted by the Census Bureau would not have been exempted. The House passed H.R. 123 on August 1, 1996.⁴⁴ In the first session of the 105th Congress, H.R. 123 was introduced on January 7, 1997, but no action was taken on this bill.

Postcensus local review. In February 1999, Rep. Dan Miller introduced a bill, H.R. 472, calling for each decennial census to include an opportunity for postcensus local review (PCLR), similar to that afforded as part of the 1990 census, so that local and tribal governmental units could review household counts, jurisdictional boundaries, and other data to identify discrepancies or other potential problems before the tabulation of state population totals was completed.⁴⁵ The bill established a timetable and guidelines for conducting the reviews, challenging census data, and correcting identified miscounts.⁴⁶

The administration and the Census Bureau strongly opposed H.R. 472. In his analysis of the legislation, Census Bureau Director Kenneth Prewitt wrote that the legislation would “. . . mandate an operational change to the Census 2000 Plan which is neither timely, effective, nor cost-efficient and would return us to inadequate 1990 operations that have now been substantially improved upon.”⁴⁷ The Director cited the Census Bureau’s new Local Update of Census Addresses (LUCA) and New Construction programs as improvements to the 1990 PCLR program that obviated the need for a similar program in 2000.⁴⁸ These new collaborative efforts with local and tribal governments were made possible by the passage of the address list-sharing legislation (P.L. 103-430, the Census Address List Improvement Act of 1994) described earlier in this section.

In April 1999, the U.S. House of Representatives approved H.R. 472 along mostly party lines.⁴⁹ After House passage, the bill was received in the Senate, which referred it to the Committee on Governmental Affairs and took no further action.

Census Monitoring Board (CMB). In June 1999, Rep. Maloney introduced legislation that would have changed the requirements for those serving on or working for the CMB (as provided for in P.L. 105-119, Title II, Section 210, and discussed earlier). Specifically, it would have barred members, staff, or contract employees of the CMB from holding senior-level management positions for a presidential or vice presidential campaign or a national committee of a political party. The bill language states that “. . . acceptance of a senior-level position in a Presidential or a Vice Presidential campaign creates a significant possibility of a conflict of interest and is incompatible with the objective, unbiased oversight required of members of the Board.”⁵⁰

Promotion and outreach. In March 1999, Rep. Miller introduced a series of bills that would have required (1) printing short-form questionnaires in at least 34 languages; (2) a second mailing of questionnaires; (3) a competitive grant program for Census 2000 outreach and promotion funds; (4) a \$300 million increase in the funding authorization for the Census 2000 advertising budget in FY 2000; and (5) expanding the Census Bureau’s Census in Schools program.⁵¹

The Census Bureau Director’s analysis referenced above (see footnote 47) also noted the agency’s strong concerns about the first two of these bills. In his analysis, the Director stated that requiring the printing of short-form questionnaires in 34 languages would force the agency to modify the

⁴⁴ *Congressional Record*, August 1, 1996, p. D860.

⁴⁵ H.R. 472, Local Census Quality Check Act (1999).

⁴⁶ The bill proposed a 9-week review of the relevant information by local and tribal government liaisons. In the 1990 PCLR program, local government liaisons had 3 weeks to review the listings for their jurisdictions. See U.S. Census Bureau, *1990 Census of Population and Housing, History, Part A*, 1990 CPH-R-2A (Washington, DC: Government Printing Office, October 1993), p. 6-45.

⁴⁷ “Census Bureau Position on Bills Concerning 2000 Census,” memorandum for the Secretary, from Kenneth Prewitt, Director, U.S. Census Bureau, March 16, 1999, p. 1.

⁴⁸ *Ibid.*, pp. 1–2. The LUCA and New Construction programs are described in Chapter 8, “Addresses and Questionnaire Printing and Mailing.” At the time, the Census Bureau had not finalized its plans for the New Construction program.

⁴⁹ *Congressional Record*, April 14, 1999, p. H2030–31.

⁵⁰ H.R. 2306, Section 1(4) (1999).

⁵¹ H.R. 929, H.R. 928, H.R. 1009, H.R. 1010, and H.R. 1058, respectively (1999).

entire workflow for questionnaire receipt, image capture, transcription and key-from-paper activities and, as a result, would require it to renegotiate its largest contracts, including those for data capture and related services and Telephone Questionnaire Assistance.⁵²

With regard to a second mailing, Director Prewitt noted that the Census Bureau's analyses and an evaluation of the dress rehearsal experience led the agency to conclude that “. . . the value of a second mailing is substantially outweighed by the risks that it introduces in other census operations.”⁵³

The analyses indicated that a second mailing targeted to nonresponding households would require delaying the start of nonresponse follow-up by 1 month and diminish the accuracy of the data. The Census Bureau tested a blanketed (sent to all households) second mailing in the dress rehearsal and found that approximately 40 percent of households that mailed back the second questionnaire had mailed in the initial questionnaire. Dr. Prewitt noted that this level of duplication during the census itself “. . . would significantly delay data processing operations and potentially introduce significant errors into the data.”⁵⁴

All five of the bills introduced by Rep. Miller were approved by the House Committee on Government Reform, but no additional action was taken.⁵⁵

Sen. Ben Nighthorse Campbell (R-CO) introduced a bill (S. 1588) in September 1999 that would have authorized the Secretary of Commerce to provide matching grants to American Indian tribes and tribal organizations to improve Native American participation in Census 2000.

Overseas Americans. Rep. Maloney in July 1999 introduced a bill expressing the sense of Congress that the Census Bureau should undertake a census of all Americans residing abroad in a special census and then review the means by which Americans living abroad could be included in the 2010 Census.⁵⁶ The previous month, the House Subcommittee on the Census held a hearing on this and other issues relating to the Census Bureau's residence rules governing the decennial census (see Appendix F). In October 1999, Sen. John D. Rockefeller IV (D-WV) introduced a bill identical to Rep. Maloney's.⁵⁷ Then, in 2000, Rep. Maloney introduced similar bills.⁵⁸

Stateside and overseas military.⁵⁹ In June 1999, Rep. Paul Ryan (R-WI) introduced a bill allocating active duty military (in the United States or abroad) to their home of record, legal residence, or last permanent duty station in the United States, in that order of priority for the 2000 decennial census.⁶⁰ The bill called for resident dependents of active duty military assigned to a permanent duty station outside of the United States to be allocated to their last state or U.S. territory of residence. However, dependents who had never lived in the United States, but were citizens, would be allocated in the same manner as their family member in the Armed Forces. This bill was discussed at the June 9, 1999, hearing referenced above, but no further action was taken.

Counting prisoners. Rep. Mark Green (R-WI) introduced a bill that would have provided that if an individual was incarcerated in a state and the state could recover from another state or states over half the costs for incarcerating the individual, then the Secretary of Commerce would count the person in the state from which the costs were recoverable.⁶¹ In Census 2000, as in past censuses, the Census Bureau counted prisoners as residents of the state in which the institution or facility was located.⁶² This bill was also discussed at the June 9, 1999, hearing, but no further action was taken.

⁵² “Census Bureau Position on Bills Concerning 2000 Census,” p. 2.

⁵³ *Ibid.*, p. 3.

⁵⁴ *Ibid.*

⁵⁵ *Congressional Record*, March 17, 1999, pp. D294–95.

⁵⁶ H.R. 2444 (1999).

⁵⁷ S. 1715 (1999).

⁵⁸ H.R. 3649 and H.R. 4568 (2000).

⁵⁹ The Census 2000 Overseas Counts Program and the enumeration of military installations and vessels are discussed in Chapter 5, “Data Collection.”

⁶⁰ H.R. 2067 (1999).

⁶¹ H.R. 1632 (1999).

⁶² The District of Columbia challenged this practice in *District of Columbia v. U.S. Department of Commerce*, claiming that because of its “complete and exclusive control and management” of the Lorton prison facility located in Virginia, the inmates at that facility should have been counted as residents of the

THE DEBATE OVER THE USE OF SAMPLING

1995 to 1997

May 1995: Census Bureau Produces Reengineered Census Plan

Following the costly litigation generated by the 1980 and 1990 censuses—particularly the litigation that sought statistical adjustment of the census counts to correct for persons estimated to have been missed or duplicated—the Census Bureau designed a plan for the 2000 census that it believed would eliminate the possibility of litigation. The Census Bureau’s May 1995 plan for a “reengineered census” was the culmination of a 4-year process of discussion and review of census plans by a broad spectrum of experts, advisors, and stakeholders.⁶³ These groups included the Task Force for Designing the Year 2000 Census, two panels of the National Academy of Sciences (NAS), census professional and race and ethnic advisory committees, as well as the Congress, the Government Accountability Office (GAO),⁶⁴ the U.S. Office of Management and Budget, and the Office of the Inspector General of the Department of Commerce.

The immediate impetus for the “reengineered census” document was the publication in December 1994 of the final report of the NAS Panel on Census Requirements in the Year 2000 and Beyond.⁶⁵ The panel added its voice to those recommending the increased use of sampling in Census 2000 and also recommended that the Census Bureau redesign the census by reexamining all facets of the census and providing information to budget and policy decision makers about the consequences of a reengineered census on both the operations and the quality of the census.⁶⁶ This is essentially the effort the Census Bureau undertook that led first to the May 1995 plan and then evolved into the plan “rolled out” in February 1996.

October 1995: Four Strategies Unveiled at Congressional Hearing

At a congressional hearing in October 1995, the Census Bureau Director outlined four strategies to meet the objectives of making every effort to include everyone in the census and eliminating the “differential undercount”—the lower-than-average coverage of minorities, young adult males, and renters.⁶⁷ These strategies were (1) building partnerships with governmental units, community groups, and the private sector; (2) simplifying the census process by, among other things, using user-friendly forms; (3) using technology intelligently to scan, check, and disseminate the data; and (4) using statistical methods to produce the data.

The plan called for using statistical sampling techniques in two principal ways.⁶⁸ The first was to alter the traditional personal visit to every housing unit that did not return a completed form (non-response follow-up). Instead of personally visiting every address that did not respond, the Census

District of Columbia in the 1990 census. The U.S. District Court for the District of Columbia upheld the Census Bureau’s residence rule for prisoners, stating that it was neither arbitrary nor capricious, nor did it violate the Census Clause of the Constitution (Article I, Section 2, Clause 3). For additional information regarding this lawsuit, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, March 1996), p. 12-7.

⁶³ U.S. Census Bureau, “The Reengineered 2000 Census,” May 19, 1995.

⁶⁴ In July 2004, Public Law (P.L.) 108-271 formally changed the name from General Accounting Office.

⁶⁵ Barry Edmonston and Charles Schultze (eds.), *Modernizing the U.S. Census* (Washington, DC: The National Academies Press, 1995).

⁶⁶ *Ibid.*, pp. 3 and 6–7.

⁶⁷ Martha Farnsworth Riche, Director, U.S. Census Bureau, “Plans for the 2000 Census,” written statement submitted to the Subcommittee on National Security, International Affairs, and Criminal Justice of the House Committee on Government Reform and Oversight, hearing of October 25, 1995.

⁶⁸ The Census Bureau had also planned to conduct—during the nonresponse follow-up operation—a follow-up on a 30 percent sample of housing units identified as vacant by the U.S. Postal Service (USPS). The agency sought to verify that these units were indeed vacant on Census Day and thereby ensure the integrity of the vacancy information provided by the USPS. After the January 1999 Supreme Court ruling in *Department of Commerce v. U.S. House of Representatives* (119 S.Ct. 765 (1999)), the Census Bureau’s revised plan included a 100 percent follow-up of such units.

Bureau plan was to visit addresses until 90 percent of the housing units in a county ⁶⁹ had responded (either by mail, telephone, or personal interview). Then it would use statistical sampling to visit 1 out of 10 of the remaining addresses, and the results from this 1 percent would be weighted to represent the entire 10 percent. This had the potential for saving time and money by reducing the number of personal visits.

The second involved taking a sample of 750,000 housing units to be matched to housing unit questionnaires obtained from mail and telephone responses as well as personal visits. The goal of this quality-check survey was to develop adjustment factors for persons estimated to have been missed or duplicated in the census and to then correct the census counts to produce one set of numbers. This was to be a “one-number census,” corrected for net coverage errors, thus called, Integrated Coverage Measurement (ICM).⁷⁰

February 1996: Official “Roll-Out” of the Reengineered Census Plan; Congressional Hearing to Review the Plan

On February 28, 1996, Commerce Department and Census Bureau officials made public “The Plan for Census 2000” and presented each of the four main strategies underlying the plan.⁷¹ Over the next several months, ten such “roll-out” presentations were made in Census Bureau regional office cities. The purpose of the initial ceremony and additional presentations was to generate interest in, knowledge about, and discussion of the plans for Census 2000.

At a hearing held February 29, 1996, before the House Government Reform and Oversight Committee, several witnesses expressed reservations about the use of sampling. Concerns were expressed about:

- The constitutionality of the use of sampling to effect a statistical adjustment.
- The effect of statistical adjustment on accurately capturing the distribution of the population among the states.
- The use of sampling—both in the nonresponse follow-up operation and the ICM program—undermining public confidence in the census.
- The accuracy of statistically adjusted counts at lower levels of geography.
- The use of statistical adjustment resulting in increased litigation, as opposed to reducing or ending it.
- Reduced participation in future censuses as a result of statistical adjustment.⁷²

The planned uses of sampling were strongly defended by two members of the NAS Panel on Census Requirements in the Year 2000 and Beyond.⁷³

September 1996 to February 1997: House Report Airs Views on Sampling; Census Bureau Response

On September 18, 1996, the House Committee on Government Reform and Oversight adopted a freestanding (not associated with any piece of legislation) report that opposed the Census

⁶⁹ This was changed to census tract in September 1996. See U.S. Census Bureau, “Commerce Revises Sampling Procedures for Census 2000,” *Census CounterParts*, Vol. 6, No. 7, October 1996. On March 11, 1997, the Census Bureau, in testimony before the Senate Governmental Affairs Committee, announced refinements to its plans for nonresponse sampling that entailed utilizing direct sampling to obtain responses from at least 90 percent of all households in each census tract and then sampling 1 in 10 to account for the remaining 10 percent (or less) of households in the tract.

⁷⁰ ICM (see the “1995 Census Test” and “Census 2000 Dress Rehearsal” sections of Chapter 2, “Planning the Census,” for more information about this program), in which the coverage measurement survey results would be “integrated” into the census itself, was a significant departure from 1990, when the results of the post-enumeration survey (PES) were used to produce a separate set of statistically adjusted counts after the delivery of the apportionment counts and redistricting data. This resulted in two competing sets of population numbers.

⁷¹ U.S. Census Bureau, “The Plan for Census 2000,” February 28, 1996.

⁷² U.S. House of Representatives, Committee on Government Reform and Oversight, “Census 2000: Putting Our Money Where It Counts,” 104th Cong., 2nd sess., February 29, 1996, pp. 9–10 and 50–51.

⁷³ *Ibid.*, pp. 105–106.

Bureau's plans to use sampling in the 2000 Census for purposes of determining the apportionment counts.⁷⁴ Among the concerns about sampling raised in the report were the subjectivity of decisions about the methodology; undermining of public confidence in the census results; accuracy of small-area data; the complexity of sampling techniques; and legal uncertainties.⁷⁵ With regard to this last aspect, the report noted that the constitutionality of sampling/statistical adjustment for apportionment purposes remained undecided and that interpretations varied as to whether Section 195 of Title 13, U.S. Code, permitted the use of sampling to produce the apportionment data.⁷⁶ Finally, it pointed out that the issue of using sampling in the nonresponse follow-up operation to complete the enumeration had not been adjudicated by any court.⁷⁷

The report also included dissenting views of minority members that expressed strong support for the use of sampling.⁷⁸ They stated that statistical adjustment could correct for the inevitable differential undercount of minorities and thereby would produce a more accurate census.⁷⁹ There was no further action on the report.

In February 1997, the Census Bureau responded to each of the six findings and five recommendations in the report. The agency responded to the "finding" that sampling methods are subjective by pointing out that its proposed sampling plan ". . . is in keeping with a long tradition of applying proven scientific methods and modern techniques to achieve less costly and more accurate censuses." It also noted that "[t]he procedures for implementing the plan are being formulated in an open process, subject to review and scrutiny by experts from the appropriate professions."⁸⁰

The Census Bureau response also addressed the concerns raised in the House Committee on Government Reform and Oversight report about the legality and constitutionality of using sampling techniques for apportionment purposes. The agency cited the March 1996 Supreme Court opinion in *Wisconsin v. City of New York* that acknowledged that the Secretary of Commerce enjoys a substantial degree of discretion in the methods used to take the census.⁸¹ However, that decision did not address either the constitutionality or the legality of sampling for apportionment purposes.

March 1997: Bills Introduced to Amend Title 13 With Regard to the Use of Sampling

Two bills were introduced in the House to "clarify" the language of Title 13 (the Census Act) with regard to the permissibility of using sampling to determine the population data used for apportionment. One bill would have, among other things, amended Section 195 of Title 13 to provide "unambiguous" language permitting the use of sampling in the decennial census for the purpose of reapportioning the U.S. House of Representatives.⁸² The other bill sought to amend Section 141 of Title 13 to provide "clear" language prohibiting the use of sampling or other statistical procedure in the census for determining the apportionment counts.⁸³ There was no action taken on either bill.

⁷⁴ U.S. House of Representatives, Committee on Government Reform and Oversight, "Sampling and Statistical Adjustment in the Decennial Census: Fundamental Flaws," 104th Cong., 2nd sess., 1996, H. Rept. 104-821.

⁷⁵ *Ibid.*, p. 2.

⁷⁶ *Ibid.*, p. 6. Title 13, U.S. Code, (the Census Act), provides the statutory authority for the Census Bureau's conduct of censuses and surveys, including the decennial census. Section 195 of Title 13, U.S. Code, reads as follows: "Except for the determination of population for purposes of apportionment of Representatives in Congress among the several States, the Secretary shall, if he considers it feasible, authorize the use of the statistical method known as 'sampling' in carrying out the provisions of this title."

⁷⁷ *Ibid.*

⁷⁸ *Ibid.*, pp. 23-32 and pp. 35-37.

⁷⁹ *Ibid.*, p. 23.

⁸⁰ Martha Farnsworth Riche, Director, U.S. Census Bureau, to Rep. Dan Burton et al., U.S. House of Representatives, February 21, 1997, enclosure entitled "Responses to the Findings and Recommendations Contained in the September 24, 1996, Report Prepared by the Committee on Government Reform and Oversight," p. 1.

⁸¹ *Ibid.*, p. 2. In *Wisconsin v. City of New York* (517 U.S. 1 (1996)), the Supreme Court unanimously upheld Secretary of Commerce Robert Mosbacher's decision not to statistically adjust the 1990 census. See the "Litigation" (specifically, "1990 Census Litigation") section of this chapter for a detailed summary of the case.

⁸² H.R. 1178, Census Accuracy Act of 1997.

⁸³ H.R. 1220, "Census, Title 13, U.S.C., Amendment" (1997).

Summer 1997: Fiscal Year 1997 Appropriations Legislation Relating to Census 2000

Beginning with the fiscal year (FY) 1997 appropriations process, the congressional majority included language in appropriations legislation that would prohibit the use of sampling in Census 2000 or the expenditure of funds for Census 2000 sampling-related planning activities. On June 9, 1997, President Clinton vetoed the Supplemental Appropriations and Rescissions Act (H.R. 1469), citing language prohibiting the use of sampling in the census for apportionment purposes as one of the reasons for his action.⁸⁴

Less than a week later, the President signed an amended version of the bill.⁸⁵ That law required the Department of Commerce to produce and send to Congress within 30 days “. . . a comprehensive and detailed plan outlining its proposed methodologies for conducting the 2000 decennial Census and available methods to conduct an actual enumeration of the population.”⁸⁶

The Census Bureau, through the Department of Commerce, delivered to Congress the report in the summer of 1997. The 60-page report discussed the importance of an accurate census; the Census 2000 plan; estimated costs for 2000 and improvements over 1990; improvements in traditional methods; the use of scientific sampling to increase accuracy; options for improving coverage in areas with high undercount rates in the absence of scientific sampling; expected error rates; procedures to ensure unbiased statistical decisions; and legal considerations.⁸⁷

November 1997: Compromise Reached in Enacted FY 1998 Appropriations Bill

The enacted FY 1998 appropriations legislation for the Departments of Justice, State, and Commerce, the Judiciary, and related agencies (Public Law [P.L.] 105-119) included language adopted in the conference committee representing a compromise between the administration and congressional leaders over the use of sampling in Census 2000.⁸⁸ The law permitted the Census Bureau to continue to plan for sampling, while directing the agency to plan for a census without statistical sampling. This was later referred to as “dual-track” planning. The statute established an eight-member Census Monitoring Board (CMB) to observe and monitor all aspects of the planning and implementation of Census 2000. Four members were to be named by the congressional leadership and four by the administration. The CMB would be terminated on September 30, 2001.

The law also purported to confer standing to bring legal action on “[a]ny person aggrieved by the use of any statistical method in violation of the Constitution or any provision of law . . . , in connection with the 2000 or any later decennial census, to determine the population for purposes of the apportionment or redistricting of Members in Congress. . . .”⁸⁹ It defined an “aggrieved person” as “(1) any resident of a State whose congressional representation or district could be changed as a result of the use of a statistical method challenged in the civil action; (2) any Representative or Senator in Congress; and (3) either House of Congress.”⁹⁰

The “Legislation” section of this chapter provides a more detailed summary and analysis of the provisions of P.L. 105-119 relating to the compromise over the use of sampling in the 2000 decennial census.

⁸⁴ “Message to the U.S. House of Representatives Returning Without Approval Emergency Supplemental Appropriations Legislation,” *Weekly Compilation of Presidential Documents*, Vol. 33, No. 24, June 16, 1997, . 847.

⁸⁵ H.R. 1871, 1997 Emergency Supplemental Appropriations Act for Recovery from National Disasters, and for Overseas Peacekeeping Efforts, Including Those in Bosnia, became P.L. 105-18 on June 12, 1997.

⁸⁶ P.L. 105-18, Title VIII (2000 Decennial Census).

⁸⁷ U.S. Census Bureau, “Report to Congress—The Plan for Census 2000,” July 1997, revised and reissued August 1997.

⁸⁸ H.R. 2267, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998, became P.L. 105-119 on November 26, 1997.

⁸⁹ P.L. 105-119, Title II, Section 209(b).

⁹⁰ *Ibid.*, Section 209(d).

In addition to the legislative compromise, administration and congressional leaders agreed that statistical sampling would not be tested in the South Carolina dress rehearsal site.⁹¹ Proponents and opponents of sampling generally agreed that a decision would have to be made by early 1999 to pursue one plan (either one with sampling or without) for Census 2000—to do otherwise would put the census at high risk of not meeting its mandated deadlines.

1998

February 1998: Lawsuits Filed to Prevent the Use of Sampling to Produce the Census 2000 Apportionment Counts

On January 12, 1998, the Census Bureau Director, after serving since November 1995, announced her resignation effective January 30.⁹² Shortly after her resignation, two lawsuits were filed in February 1998 that challenged the legality and constitutionality of the use of sampling to produce the apportionment counts. The plaintiffs in both suits cited the provisions of P.L. 105-119 as providing a “right of action.” *Glavin v. Clinton* and *U.S. House of Representatives v. Department of Commerce* (as filed) challenged the proposed uses of sampling to produce the apportionment counts, seeking a declaration stating that their use would violate the Census Act and the Census Clause of the Constitution and an injunction barring their implementation in Census 2000.⁹³

On August 24, 1998, the U.S. District Court for the District of Columbia in the *U.S. House of Representatives* case held that Section 195 of Title 13 prohibited the use of sampling to produce the apportionment counts, and enjoined the Census Bureau from implementing its planned uses of statistical sampling to produce the Census 2000 apportionment counts.⁹⁴ On September 24, the U.S. District Court for the Eastern District of Virginia in the *Glavin* case also held that Section 195 barred the use of sampling for apportionment purposes and enjoined both proposed uses in the production of the apportionment counts.⁹⁵

The Department of Commerce sought review of the district court decisions by the U.S. Supreme Court. The Supreme Court agreed to hear the cases and consolidated them for purposes of oral argument, which took place on November 30, 1998. On January 25, 1999, the Court held that the Census Bureau’s proposed plan to use statistical sampling in the decennial census for purposes of determining congressional apportionment violated the Census Act.⁹⁶

Fall 1998: FY 1999 Appropriations for Census 2000 Preparatory Activities

Passage of FY 1999 appropriations for the Departments of Commerce, Justice, and State, and the Judiciary was delayed by disagreement over language seeking restrictions on the use of funds to continue to plan to implement sampling in Census 2000. By late September, Congress approved a continuing resolution to fund government activities past September 30—the end of the fiscal year—for those departments and agencies, including the Commerce Department, whose regular appropriations bills had not been enacted. Additional continuing resolutions were enacted through the first 3 weeks of October.

By mid-October, an agreement was reached regarding FY 1999 funding for Census 2000 activities. The Census Bureau was appropriated \$1.027 billion in FY 1999 for preparing for Census 2000, \$75 million more than the amount in the House-passed appropriations bill. Of the \$75 million,

⁹¹ The Census Bureau had selected the following three sites in which to conduct the Census 2000 Dress Rehearsal in April 1998: Sacramento, CA; Menominee County, WI; and Columbia, SC, and its 11 surrounding counties. U.S. Department of Commerce, “CA, WI, SC Selected for Census 2000 Dress Rehearsal,” *Commerce News*, July 29, 1996, CB96-O.15. In the South Carolina site, estimates of net over- or undercoverage would be produced, but not integrated into the census numbers.

⁹² U.S. Census Bureau, *Census 2000 Bulletin*, (12 January 1998) Vol. 2, No. 2; U.S. Census Bureau, *Census 2000 Bulletin*, (30 January 1998) Vol. 2, No. 5.

⁹³ Summary information about the district court cases is taken from *Department of Commerce v. U.S. House of Representatives*, 525 U.S. 316, 327 (1999).

⁹⁴ *Ibid.*

⁹⁵ *Ibid.*

⁹⁶ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999). The Supreme Court decision is discussed in more detail below.

\$40 million was to be used for activities associated with a nonsampling census.⁹⁷ Under the terms of the agreement, the flow of funding to the entire Commerce, Justice, State, and the Judiciary account would stop on June 15, 1999, unless a new measure granting spending authority had been enacted by that time.⁹⁸

Because the Commerce, Justice, State, and the Judiciary appropriations bill was one of a number of major appropriations bills not passed by the Congress prior to the start of the new fiscal year, the funding for that account was included in an omnibus spending package. Congress approved the \$487 billion omnibus spending package, and the Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999, H.R. 4328, was signed into law (P.L. 105-277) on October 21, 1998.⁹⁹

1999

This year saw the first substantive meetings of the Census Monitoring Board and the issuance of its first statutorily mandated reports. More importantly, the Supreme Court issued a decision in the *U.S. House of Representatives* case prohibiting the use of sampling to produce the apportionment counts. Thus, the Census Bureau could no longer pursue the plan it had issued in November 1998 that included the Integrated Coverage Measurement (ICM) program and sampling for nonresponse follow-up. However, the debate over the use of sampling in Census 2000 continued, as a result of the administration's interpretation of the decision in the *U.S. House of Representatives* case as permitting adjustment of the census for purposes of redistricting and federal funding.

January 1999: Supreme Court Decision and Administration Interpretation

As mentioned earlier, on January 25, 1999—less than 2 weeks after the Census Bureau delivered to Congress the *Census 2000 Operational Plan Using Traditional Census-Taking Methods*¹⁰⁰—the Supreme Court issued its decision in *Department of Commerce v. U.S. House of Representatives*, concluding that Section 195 of the Census Act (Title 13, U.S. Code) precluded the use of sampling to produce the congressional apportionment counts.¹⁰¹

When the Congress amended Title 13, U.S. Code, in 1976, one of the revisions involved Section 195. The phrase “the Secretary may, where he deems it appropriate” was changed to “the Secretary shall, if he considers it feasible.”¹⁰² The administration interpreted the revised except/shall language to mean that Congress made (through the 1976 amendments) sampling permissible for apportionment purposes, but obligatory (*shall*) for all other purposes (upon a determination of feasibility). The Court did not accept that interpretation and found that the legislative history did not support the administration's interpretation of Section 195. Thus, the Court, in a 5 to 4 majority opinion, concluded that if Congress had intended to permit such a dramatic change (with the 1976 amendments) to the way in which the apportionment counts were produced, it would have been abundantly clear in both the plain text and the legislative history.¹⁰³

⁹⁷ Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999, P.L. 105-277, 112 Stat. 2681-80.

⁹⁸ 112 Stat. 2681-117.

⁹⁹ *Congressional Record*, November 12, 1998, p. D1202.

¹⁰⁰ This plan—created in order to comply with the requirements of P.L. 105-119, Title II, Section 209(j) that the Census Bureau be prepared to implement a “nonsampling” census—included new (for example, coverage improvement follow-up) or enhanced (for example, coverage edit and telephone follow-up) operations to improve coverage. Unlike the agency's original plan, it included neither the ICM program, which was designed to measure and correct for net over- and undercoverage errors, nor sampling for nonresponse follow-up. In further refining its plans for utilizing traditional census-taking methods to produce the apportionment counts, the Census Bureau subsequently expanded its partnerships program and expanded and enhanced its paid advertising and promotion program to improve public response and cooperation. (For more information on these programs, see Chapter 4, “The Partnership and Marketing Program.”) Additionally, for particular field operations, the agency implemented enhanced training of field workers and added or enhanced quality assurance programs. (For more information on field training and quality assurance programs for data collection operations, see the relevant sections of Chapter 5, “Data Collection.”)

¹⁰¹ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999). See footnote 76 for the text of 13 U.S.C. § 195.

¹⁰² Mid-decade Census of Population, P.L. 94-521, 90 Stat. 2464.

¹⁰³ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765, 779 (1999).

Having determined the use of sampling to produce the congressional apportionment counts violated Section 195 of Title 13, U.S. Code, the Court did not address the constitutionality of sampling.¹⁰⁴ However, the Court's decision was interpreted by the administration as affirming the legality of statistical sampling for purposes other than apportionment, including redistricting, if doing so were determined to be "feasible" (the language used in Section 195 of the Census Act). Consequently, the Census Bureau proceeded with its plans to produce a statistically adjusted census count for purposes of redistricting and federal funding. It should be noted that, as discussed in the "Legislation" section of this chapter, provisions of P.L. 105-119 (the FY 1998 Commerce Department appropriations act) required that the data produced for redistricting (P.L. 94-171 files) and used for federal funding ("STF-1" files¹⁰⁵) be released indicating "the number of persons enumerated without using statistical methods."¹⁰⁶ This requirement in combination with the administration's interpretation of the *U.S. House of Representatives* decision, meant that two sets of numbers might be produced for redistricting and other nonapportionment purposes—one adjusted and one not adjusted.

The administration's interpretation of the *U.S. House of Representatives* decision was not universally shared. The Congressional Research Service (CRS), the public policy research arm of Congress, issued a report examining this interpretation and concluded that ". . . technically, the position of sampling proponents, that sampling in intrastate redistricting is required, is not inconsistent with the Court's holdings on the merits, but is arguably inconsistent with the apparent assumptions and larger scheme underlying the holdings."¹⁰⁷

Late February 1999: Release of "Updated Summary: Census 2000 Operational Plan"

On February 23, the Department of Commerce released "Updated Summary: Census 2000 Operational Plan," summarizing the programs and operations discussed in the previous congressional report entitled *Census 2000 Operational Plan Using Traditional Census-Taking Methods*. The "Updated Summary" also included a section on the Accuracy and Coverage Evaluation (A.C.E.) survey, a coverage measurement survey ". . . corresponding to the Post Enumeration Survey (PES) in past censuses and the Integrated Coverage Measurement [(ICM) survey] in the original Census 2000 plan. . . ."¹⁰⁸ These coverage measurement programs were designed to estimate and statistically adjust for overall and differential net coverage errors in the census.

The document noted important developments since the release of the nonsampling operational plan in mid-January, especially the recent Supreme Court decision. The "Updated Summary" reported that it would be feasible ". . . to conduct and complete the statistical procedures necessary to provide corrected [statistically adjusted] data for all purposes other than apportionment within the legally mandated schedule. . . . [and] that such corrected data will be substantially more accurate than the raw data."¹⁰⁹ The document explained that the results from the A.C.E. would not be used to adjust the census figures for apportionment purposes, but would ". . . be made available to federal agencies and state and local governments for other purposes."¹¹⁰

April 1999: Census Bureau Releases Dress Rehearsal Data on Net Coverage Error by Race and Ethnicity

On April 20, the Census Bureau issued a news release reporting results from the dress rehearsal conducted the previous year. Specifically, it contained unadjusted and adjusted data by race and ethnicity for the Sacramento, CA, and Menominee County, WI, sites. As mentioned earlier, the

¹⁰⁴ The Supreme Court's decision is discussed in greater detail in the "Litigation" section of this chapter.

¹⁰⁵ "STF-1" is a reference to Census 2000 Summary File 1 (SF 1), which contains data derived from a number of basic questions asked of the entire population and every housing unit. It contains data for race groups and for the Hispanic or Latino population, including population counts for detailed race and Hispanic categories.

¹⁰⁶ P.L. 105-119, Title II, Section 209(j).

¹⁰⁷ Margaret Mikyung Lee, legislative attorney, American Law Division, Congressional Research Service, The Library of Congress, "Sampling for Census 2000: *Department of Commerce v. United States House of Representatives* and Its Ramifications," CRS Report for Congress, February 3, 1999, p. 5.

¹⁰⁸ Department of Commerce, "Updated Summary: Census 2000 Operational Plan," February 23, 1999, p. 13.

¹⁰⁹ *Ibid.*, p. 1.

¹¹⁰ *Ibid.*, p. 13.

Census Bureau did not use the ICM to correct for net coverage error in the South Carolina site, in keeping with the fall 1997 agreement between the administration and the congressional leadership on the issue of sampling. However, estimates of net over- and undercoverage were produced for that site.

The Census Bureau concluded from these results that “[t]he data showed across-the-board that the undercount, which has been measured in every census since 1940, persists today, but that scientific methods used at two of the three sites corrected for it.”¹¹¹

Early May 1999: National Academy of Science (NAS) Panel Commends Census Bureau Methodological Work on the A.C.E.

On May 3, the NAS Panel to Review the 2000 Census issued a report on the Census Bureau’s work to finalize the design of the A.C.E. This NAS panel—the last of four that were convened in connection with Census 2000—had been constituted in 1998 to review the plans, procedures, and operations for both the dress rehearsal and Census 2000. Specifically, experts from this panel were charged with examining, among other things, “. . . the statistical methods of the 2000 census, particularly the use of the Accuracy and Coverage Evaluation Program and dual-systems estimation. . . .”¹¹²

In the wake of the Supreme Court decision that the use of statistical sampling for apportionment purposes is in violation of the Census Act, the Census Bureau determined that the coverage measurement survey originally to be conducted as part of the ICM program should be redesigned, given the remaining potential uses of the adjusted data—redistricting and federal funding, among others. For example, the Census Bureau reduced the sample size of the A.C.E. survey to approximately 300,000 households, down from the 750,000 households planned for the ICM program. Also, given that the survey-based numbers were not going to be used for apportionment purposes, the Census Bureau concluded that it now had greater flexibility in the post-stratification design.¹¹³ The NAS Panel said that the Census Bureau’s A.C.E. design work “. . . represents good, current practice in both sample design and post-stratification design, as well as in the interrelationships between the two” and offered a number of suggestions in connection with outstanding design issues.¹¹⁴

May 1999: Budget Agreement Reached

On May 20, the Congress approved an emergency funding bill that lifted the threat of a June 15 funding cut-off to the FY 1999 Commerce, Justice, State, and the Judiciary account.¹¹⁵ (See earlier discussion under “Fall 1998: FY 1999 Appropriations for Census 2000 Preparatory Activities.”) The 1999 Emergency Supplemental Appropriations Act (H.R. 1141), which became P.L. 106-31 on May 21, 1999, contained a provision repealing the June 15 funding cut-off language in P.L. 105-277.¹¹⁶ The bill included an additional \$44.9 million in FY 1999 funding for Census 2000. (Congress had already appropriated \$1.027 billion in P.L. 105-277.) The supplemental funding was needed to cover preparations for expanded field operations and for additional advertising and promotion activities.¹¹⁷ Specifically, much of the added funds was required to prepare for the additional field

¹¹¹ U.S. Department of Commerce, “Census 2000 Dress Rehearsal Shows Undercount Persists; Scientific Methods Correct Race and Ethnic Differential,” *Commerce News*, April 20, 1999, CB99-CN.16 (revised), p. 1.

¹¹² Constance F. Citro, Daniel L. Cork, and Janet L. Norwood (eds.), *The 2000 Census: Counting Under Adversity* (Washington, DC: The National Academies Press, 2004), p. 1.

¹¹³ See the A.C.E. section of Chapter 10, “Testing, Experimentation, Evaluation, and Coverage Measurement Programs,” for more information regarding this point and about post-stratification in the A.C.E., generally. In post-stratification, the sample is divided into separate estimation cells according to race, Hispanic origin, tenure (refers to whether a person owns or rents the housing unit in which he/she resides), age, sex, and other variables.

¹¹⁴ Janet Norwood, chair, NAS Panel to Review the 2000 Census, letter-report to Dr. Kenneth Prewitt, Director, U.S. Census Bureau, May 3, 1999, as reprinted in *The 2000 Census: Counting Under Adversity*, pp. 360–61.

¹¹⁵ *Congressional Record*, May 20, 1999, p. D562 (passed the Senate); May 18, 1999, p. D545 (passed the House).

¹¹⁶ 1999 Emergency Supplemental Appropriations Act, P.L. 106-31, 113 Stat. 100.

¹¹⁷ 113 Stat. 86-87.

work necessitated by the Supreme Court ruling in *Department of Commerce v. U.S. House of Representatives*. That is, field follow-up would be conducted for all nonresponding households—not a sample of the last 10 percent (or more) as previously planned.

The statute also required the administration to submit a revised FY 2000 funding request for Census 2000 by June 1.¹¹⁸ The administration's original FY 2000 budget request of \$2.8 billion—submitted in early February—had been prepared prior to the Supreme Court's decision in *Department of Commerce v. U.S. House of Representatives*.

Early June 1999: Administration Sends Congress Revised FY 2000 Budget Request for Census 2000

The administration's revised FY 2000 budget request for Census 2000, submitted on June 8, called for an increase of \$1.7 billion from the original \$2.8 billion, for a total of \$4.5 billion.¹¹⁹ The revised figure assumed an estimated 50 percent increase in the field follow-up workload (for a total of approximately 45 million households), requiring a 10-week instead of a 6-week operation. The additional costs associated with the expanded nonresponse follow-up operation were due to the following factors, among others: hiring of additional local office staff, particularly enumerators; increasing the amount of office space and equipment; and adding greater data processing and data transmission capacity. The Census Bureau also planned to expand its outreach and promotion activities, including significantly enlarging the scope of its paid advertising campaign to achieve a higher level of responsiveness from traditionally difficult-to-enumerate segments of the population.¹²⁰

August 1999: House Approves Nearly \$4.5 Billion for Census 2000 in FY 2000; Designates the Full Amount as Emergency Spending

On August 5, the House passed H.R. 2670, a bill making FY 2000 appropriations for the Departments of Commerce, Justice, and State, the Judiciary, and related agencies.¹²¹ The legislation included \$4.476 billion for Census 2000 activities, the same amount as that approved earlier by the Appropriations Committee. It retained the committee's emergency spending designation for the full amount of those funds.¹²² By designating the FY 2000 Census 2000 expenditures as emergency spending, the funds were exempted from preset discretionary spending ceilings.

October to Late November 1999: Census Bureau Must Operate Under Series of Continuing Resolutions Until Omnibus Spending Measure Is Enacted Into Law

With the start of the 2000 fiscal year on October 1, 1999, the Departments of Commerce, Justice, and State, and the Judiciary appropriations bill had not been enacted into law, and the Census Bureau had to operate under a series of continuing resolutions. The preparations for Census 2000 were proceeding and inadequate funding would significantly jeopardize the planned schedule as well as the accuracy of the census results. While other departments and agencies operating under the first and subsequent continuing resolutions during the fall of 1999 were obligated to function at FY 1999 funding levels, the Census Bureau had worked with Congress to ensure that it would receive adequate Census 2000 funding with the start of FY 2000.

A revised version of the Departments of Commerce, Justice, and State, and the Judiciary appropriations bill was reintroduced as H.R. 3421 on November 17, and it retained the \$4.476 billion in

¹¹⁸ 113 Stat. 87.

¹¹⁹ U.S. House of Representatives, Committee on Appropriations, report to accompany H.R. 2670, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Bill, Fiscal Year 2000. 106th Cong., 1st sess., 1999, H. Rept. 106-283, p. 67.

¹²⁰ U. S. Senate, Subcommittee on Commerce, Justice, and State, the Judiciary, and Related Agencies of the Committee on Appropriations. Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Fiscal Year 2000 President's Budget Amendment. 106th Cong., 1st sess. (Washington, DC: Government Printing Office, 1999), July 29, 1999, pp. 4–5.

¹²¹ *Congressional Record*, August 5, 1999, p. H7383-84.

¹²² H.R. 2670, Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 2000, Title II, Bureau of the Census, "Periodic Censuses and Programs" section, as approved by the House.

funding for Census 2000 activities as emergency spending.¹²³ H.R. 3421 was incorporated into the conference report for H.R. 3194, Consolidated Appropriations Act, 2000. This omnibus package was approved by the House on November 18 and by the Senate the following day.¹²⁴ On November 29, the president signed it into law (P.L. 106-113).¹²⁵

December 1999: Census Bureau's Executive Steering Committee for Accuracy and Coverage Evaluation Policy Holds First Meetings

The Executive Steering Committee for Accuracy and Coverage Evaluation Policy (ESCAP), which was created the previous month, held its first meetings in December 1999. As explained in its charter, it was “. . . established to advise the Director in determining policy for the Accuracy and Coverage Evaluation (A.C.E.) and the integration of A.C.E. results into the census for all purposes except Congressional reapportionment.”¹²⁶ The charter listed the membership of the ESCAP, with the associate director for decennial census serving as the chair, and the Census Bureau Director serving as an *ex-officio* member of the committee.

The role of the ESCAP in recommending to the Census Bureau Director whether or not to release as the official redistricting data (P.L. 94-171 data files) census data that incorporated a statistical adjustment was later promulgated into regulation (see below).

2000

Census Day was April 1, 2000, and with the enumeration underway, the sampling debate continued to focus on the possible use of the adjusted data for redistricting and federal funding allocation. In June, the Department of Commerce proposed a rule on the possible incorporation of the A.C.E. results in the official redistricting data to be released by April 1, 2001. In the fall, the department finalized the rule. Additionally, at an October 2 public meeting before the NAS Panel to Review the 2000 Census, the Census Bureau presented prototype reports of the analyses and evaluations it planned to conduct of the census and A.C.E. operations and data to support the justification for or against a statistical adjustment of the redistricting data.

June 2000: Department of Commerce Issues Proposed Rule

On June 20, the Department of Commerce issued a notice of proposed rule-making on the procedure for determining whether the official redistricting data would incorporate a statistical adjustment.¹²⁷ Specifically, the proposed rule delegated to the Census Bureau Director the authority for determining whether to incorporate A.C.E. results in the official redistricting data and provided that “the determination of the Director of the Census shall not be subject to review, reconsideration, or reversal by the Secretary of Commerce.”¹²⁸

The Director's decision would follow receipt of the ESCAP's recommendation as to whether or not the official redistricting data should incorporate a statistical adjustment based on the results of the A.C.E. The ESCAP's recommendation and report would be made public at the same time it was delivered to the Director. The proposed rule also formalized, by position, the membership of the ESCAP.¹²⁹

¹²³ *Congressional Record*, November 17, 1999, p. H12225.

¹²⁴ *Congressional Record*, November 18, 1999, p. D1315 (passed the House); November 19, 1999, p. D1321 (passed the Senate).

¹²⁵ *Congressional Record*, December 3, 1999, p. D1335.

¹²⁶ U.S. Census Bureau, “Charter for the Executive Steering Committee for A.C.E. Policy,” November 26, 1999.

¹²⁷ For additional information regarding the proposed rule, see *Federal Register*, Vol. 65, No. 119 (June 20, 2000) (Proposed Rule), pp. 38370–71 and 38374–98.

¹²⁸ *Ibid.*, p. 38371.

¹²⁹ *Ibid.* The membership of the ESCAP was defined as follows: deputy director and chief operating officer; principal associate director and chief financial officer; principal associate director for programs; associate director for decennial census (chair); assistant director for decennial census; associate director for demographic programs; associate director for methodology and standards; chief, Planning, Research, and Evaluation Division; chief, Decennial Management Division; chief, Decennial Statistical Studies Division; chief, Population Division; and senior mathematical statistician.

Finally, the rule also stipulated that, if the Census Bureau Director decided to release unadjusted data as the official redistricting data, notwithstanding a recommendation to the contrary from the ESCAP, the statistically adjusted data would still be made available to the public.¹³⁰

October 2000: Department of Commerce Issues Rule in Final Form

On October 6, the rule, only slightly modified, was published in final form in the *Federal Register*.¹³¹ In the final version of the rule, language was added to clarify that the delegation of authority could be amended or revoked by the Secretary of Commerce pursuant to the rule-making process. The rule was to become effective on November 6, 2000. The *Federal Register* notice also included a summary of and responses to comments received as a result of the publication of the proposed rule.

The Census Bureau received comments in support of the proposed rule from several former directors of the Census Bureau; survey research and social science organizations; individuals affiliated with universities or university-based research institutions; 69 members of Congress; national associations and organizations; and state and local government officials.¹³²

Common to the comments in support of the rule were the following two points: (1) the decision on whether to statistically adjust data from Census 2000 to be used for redistricting and other nonapportionment purposes was a technical/scientific decision that should be made by the Census Bureau Director upon the recommendation of his professional staff and (2) the rule ensured that other, irrelevant considerations did not affect the decision-making process.¹³³

Comments in opposition to the rule were received from individuals affiliated with universities or university-based research institutions; six members of Congress; state government officials; and others. Among these comments were several letters contending that the proposed rule was unlawful. Common to these letters was the argument that the delegation of authority constituted an unlawful divestiture of authority and responsibility vested in the Secretary of Commerce by Congress under relevant sections in Title 13.¹³⁴

November 2000: NAS Panel Provides Feedback on Proposed Analyses to Inform the ESCAP Recommendation

On November 9, the NAS Panel to Review the 2000 Census sent the Director comments on the proposed analyses that the Census Bureau planned to conduct for the redistricting data adjustment decision. The NAS Panel recognized the difficult task the Census Bureau faced in analyzing the census and A.C.E. data within the deadline for releasing redistricting data to the states.

It concluded that:

[t]he planned analyses appear to cover all of the evaluations that can reasonably be expected to be completed within the time available. Furthermore, they appear to be sufficiently comprehensive that they will likely provide support for a reasonably confident decision on adjustment in March.¹³⁵

2001

By the start of the new year, the apportionment counts had been delivered to the President. The Director acknowledged that the national population count was higher than expected, based on comparisons with independently derived population estimates. However, he cautioned that until

¹³⁰ Ibid.

¹³¹ *Federal Register*, Vol. 65, No. 195 (October 6, 2000) (Final Rule), pp. 59713–16.

¹³² Comments received on the proposed rule can be found on the Census Bureau's Web site at <<http://www.census.gov/dmd/www/Feascom.htm>>.

¹³³ *Federal Register*, Vol. 65, No. 195 (October 6, 2000), p. 59714.

¹³⁴ Ibid., p. 59715.

¹³⁵ Janet Norwood, chair, NAS Panel to Review the 2000 Census, letter-report to Kenneth Prewitt, Director, U.S. Census Bureau, November 9, 2000, as reprinted in Constance F. Citro, Daniel L. Cork, and Janet L. Norwood (eds.), *The 2000 Census: Counting Under Adversity* (Washington, DC: The National Academies Press, 2004), pp. 370–71.

the Census Bureau conducted additional analyses, it lacked knowledge of the accuracy of the count.¹³⁶ In an early initiative, the incoming administration changed the decision-making process for determining whether to adjust the redistricting data, reinstating the Secretary of Commerce's prerogative, prompting litigation.¹³⁷ Also, the subsequent decision not to adjust for redistricting and to withhold the adjusted data spawned a number of Freedom of Information Act requests and additional litigation.

In the fall of 2001, a separate decision was made regarding adjustment of the data for nonapportionment, nonredistricting uses, again concluding that adjustment would not improve the accuracy of the census counts. Following the second decision, the Census Bureau committed itself to continued evaluation of the A.C.E. data and investigation of possible programmatic uses of subsequently revised A.C.E. estimates.

February 2001: Census Bureau Releases Preliminary A.C.E. Estimated Ranges of Net Coverage Error in Census 2000

On February 14, the Census Bureau reported preliminary national-level estimated ranges of net coverage error—based on the results of the A.C.E.—for the total population and for selected population, tenure, and age groups. These data were produced as part of the ESCAP's ongoing assessments of the census counts and A.C.E. data. Among other things, the data indicated lower net undercount rates for the total population and for non-Hispanic Blacks and Hispanics than in 1990.¹³⁸

February 2001: Commerce Secretary Rescinds Census Bureau Director's Authority to Make Adjustment Decision and Issues New Rule Governing Process

As the statutory deadline for providing the redistricting data approached¹³⁹ and, of necessity, the decision whether to adjust those data, the Secretary signed a rule on February 16 rescinding the delegation of authority to the Census Bureau Director to determine whether to release adjusted redistricting data. On February 23, the Department of Commerce published the new rule in the *Federal Register*, effective immediately.¹⁴⁰

Under the terms of the new rule, the Secretary would not make his determination until after he received the ESCAP's report and the Director's recommendation (if any) regarding the methodology (that is, incorporating or excluding a statistical adjustment) to be used in producing the tabulations of redistricting counts reported to states and localities under Title 13, U.S. Code, Section 141(c). The ESCAP report and Director's recommendation would be released to the public simultaneously with their delivery to the Secretary. The new rule also removed the section of the previous rule that discussed the release of the adjusted data under alternative decision scenarios, citing the need for additional study of the issue.

Late February 2001: City of Los Angeles and Others File Lawsuit Challenging Secretary's Revocation of the Delegation of Authority

After the final rule was signed and prior to its publication in the *Federal Register*, the city of Los Angeles and other plaintiffs filed suit on February 21 in the U.S. District Court for the Central District of California, claiming that the Secretary's revocation of the delegation of authority was in violation of the Administrative Procedure Act's notice and comment requirements for making other than minor amendments to a substantive rule. The plaintiffs contended that the revocation constituted a substantive change to the rule, given that the purpose of the October 2000 final rule

¹³⁶ Steven A. Holmes, "Americans Number 281,421,906 in Census," *New York Times*, December 29, 2000.

¹³⁷ *City of Los Angeles v. Evans*, 307 F.3d 859 (9th Cir. 2002). This lawsuit is discussed below.

¹³⁸ "Preliminary Estimates Show Improvement in Census 2000 Coverage," *U.S. Census Bureau News*, February 14, 2001, CB01-CN.03, p. 1. The press release can be accessed on the Census Bureau's Web site at <<http://www.census.gov/Press-Release/www/releases/archives/census2000/000641.html>>. This page provides a link to the preliminary estimates. The estimated ranges of percent net undercount for the total (household) population and for major race/ethnicity groups are presented in Table 11-1.

¹³⁹ April 1, 2001; see 13 U.S.C. 141(c).

¹⁴⁰ *Federal Register*, Vol. 66, No. 37 (February 23, 2001) (Final Rule), pp. 11231–33.

was to “. . . insulate from partisan politics the final determination of which census data should be released. . . .”¹⁴¹ Plaintiffs requested a temporary restraining order and preliminary and permanent injunctions prohibiting the new rule from taking effect.

Following the Secretary’s decision not to adjust the redistricting data, discussed below, plaintiffs amended their complaint to compel the Secretary to release the adjusted data as the official redistricting data. The U.S. District Court for the Central District of California upheld the Secretary’s decision not to adjust the redistricting data.¹⁴² The case was ultimately decided by the U.S. Court of Appeals for the Ninth Circuit, which affirmed the district court’s decision upholding the Secretary’s determination.¹⁴³

Early March 2001: ESCAP Recommends Against Statistical Adjustment; Acting Director and Secretary Concur With and Adopt Committee Recommendation

The ESCAP concluded its analysis and issued its report and recommendation on March 1.¹⁴⁴ In evaluating the relative accuracy of the unadjusted data versus the adjusted data for use in redistricting, the ESCAP concluded that both Census 2000 and the A.C.E. were of high quality and that design improvements in both Census 2000 and A.C.E. operations produced measurably better results than previous censuses and coverage measurement surveys, respectively. While stating that “. . . the majority of the evidence indicates . . . the superior accuracy of the adjusted numbers . . .”¹⁴⁵ the committee identified a number of concerns. Because of these concerns, the ESCAP recommended releasing the unadjusted data as the official data for redistricting purposes, but noted that further investigation might likely reveal that adjustment based on the A.C.E. data would improve overall accuracy of the census.¹⁴⁶

This recommendation was based on a careful examination of estimates produced by demographic analysis (DA)¹⁴⁷ and the A.C.E., against the actual census counts.¹⁴⁸ The ESCAP’s principal concern related to the fundamental differences between the DA and A.C.E. estimates that could not be explained. The estimates differed widely, both for the total national population and for important population groups. The committee investigated this inconsistency extensively, but could not adequately explain it within the time frame for issuing its recommendation, which was determined by the statutory deadline for releasing the redistricting data to the states (April 1, 2001). The ESCAP concluded that further investigation was necessary to explain and resolve the discrepancies.

Based on the ESCAP report, the Acting Director of the Census Bureau informed the Secretary that he concurred with and adopted the ESCAP’s recommendation. On March 6, the Secretary of Commerce announced that he had accepted the recommendation of both the Acting Director and the

¹⁴¹ *City of Los Angeles v. Evans*, No. CV 01-1671, in the U.S.D.C. for the Central District of California, Complaint for Declaratory and Injunctive Relief, ¶ 27.

¹⁴² *City of Los Angeles v. Evans*, 2001 WL 34125617 (C.D.Cal. April 25, 2001). This case was not selected for publication in the *Federal Supplement*.

¹⁴³ *City of Los Angeles v. Evans*, 307 F.3d 859 (9th Cir. 2002). The Ninth Circuit Court of Appeals decision is discussed below.

¹⁴⁴ *Federal Register*, Vol. 66, No. 46 (March 8, 2001), pp. 14004–46. In addition to the ESCAP report itself, the Census Bureau made material relating to the ESCAP process and the A.C.E. in general available on the Web: <<http://www.census.gov/dmd/www/EscapRep.html>>. Among the documents accessible from this Web page are the prototype (presented at the fall 2000 NAS Panel workshop) and final “B-series” analysis reports and the minutes of the ESCAP meetings.

¹⁴⁵ *Ibid.*, p. 14005.

¹⁴⁶ *Ibid.*

¹⁴⁷ DA is a statistical technique that measures coverage trends as well as differences in coverage by age, sex, and race. DA uses records or estimates of births, deaths, immigration, emigration, and Medicare enrollments, and the results of the current and previous censuses, to develop estimates of the population at the national level.

¹⁴⁸ The Census 2000 count of the total population was 281,421,906; the A.C.E. estimate was 284,683,782 (indicating a net undercount of 1.15 percent); and the higher of the two DA estimates (the “alternative” DA estimate) was 282,335,711 (indicating a net undercount of .32 percent). These numbers are for the total resident population (including group quarters). See J. Gregory Robinson, “Accuracy and Coverage Evaluation: Demographic Analysis Results,” DSSD Census 2000 Procedures and Operations Memorandum Series B-4*, March 12, 2001, Table 3, p. 22. Table 11-2 contains the A.C.E. estimates of percent net undercount for the total (household) population and for major race/ethnicity groups, as presented in the ESCAP’s March 1, 2001 report.

ESCAP and had determined that the unadjusted data would be released as the Census Bureau's official redistricting data.¹⁴⁹ The release of the adjusted data would be considered at a later time following the ESCAP's further investigation.¹⁵⁰

March to April 2001: Following the Adjustment Decision, Numerous Calls for the Release of the Adjusted Data

In the wake of the adjustment decision, there were numerous calls from members of Congress, presidential members of the Census Monitoring Board (CMB), and others for release of the adjusted block-level data, in part to allow external scientific scrutiny of the data.¹⁵¹ The Department of Commerce denied such requests, stating that it would be inappropriate and irresponsible to release the data given the continuing uncertainties regarding their quality and accuracy.¹⁵² The Census Bureau Acting Director reiterated that the released unadjusted data were the most accurate data available. The Census Bureau noted that the ESCAP would continue its research and analyses of the data over the summer in order to make a recommendation in the fall regarding possible nonredistricting uses of the adjusted data. Further, the agency revealed that it had already made available a substantial amount of detailed information on the A.C.E. and other aspects of Census 2000 that would enable external examination of the adjustment methodology.

April 2001: Members of Congress Request Adjusted Block-Level Data Under the "Seven Member Rule"

On April 6, a number of members of the House Committee on Government Reform, of which the Census Subcommittee was part, requested from the Secretary of Commerce the adjusted block-level data for all states by April 20, 2001.¹⁵³ Noting that the Government Reform Committee had legislative and oversight responsibilities for matters relating to population and demography, including the census, they requested the adjusted block-level data under the "Seven Member Rule." Under the provisions of the Seven Member Rule,

[a]n Executive agency, on request of the Committee on Government Operations [renamed the Committee on Government Reform in the 106th Congress] of the U.S. House of Representatives, or any seven members thereof, . . . shall submit any information requested of it relating to any matter within the jurisdiction of the committee.¹⁵⁴

When the Department of Commerce failed to respond by the deadline set forth in the request, the requesting committee members filed suit on May 21 in the U.S. District Court for the Central District of California to compel the release of the Census 2000 adjusted block-level data under the Seven Member Rule.¹⁵⁵

¹⁴⁹ The Secretary's decision is documented in *Federal Register*, Vol. 66, No. 49 (March 13, 2001), pp. 14520–21.

¹⁵⁰ Transcript of press conference on Census 2000 redistricting data, held at the U.S. Department of Commerce, March 6, 2001, Federal News Service, Washington, DC, p. 4.

¹⁵¹ Following the Secretary's decision, no A.C.E. results below the national level were publicly released. The Census Bureau and the Department of Commerce received numerous requests for the adjusted data (in most cases, at the block-level) under the Freedom of Information Act (FOIA). The department denied all such requests, citing Exemption 5 (deliberative process privilege) of the FOIA. In connection with one such request, the ensuing FOIA lawsuit reached the U.S. Court of Appeals for the Ninth Circuit. That case (*U.S. Department of Commerce v. Carter*) is discussed below. The numerous FOIA requests for the adjusted data and the associated litigation are discussed in the relevant sections of this chapter.

¹⁵² As an example of one such response, see William G. Barron, Jr., Acting Director, U.S. Census Bureau, to Rep. Carolyn B. Maloney et al., U.S. House of Representatives, April 9, 2001.

¹⁵³ Rep. Henry A. Waxman et al., Committee on Government Reform, U.S. House of Representatives, to Donald L. Evans, Secretary, U.S. Department of Commerce, April 6, 2001.

¹⁵⁴ Title 5, U.S. Code, Section 2954 (2006).

¹⁵⁵ *Waxman v. Evans*, No. CV014530LGB (AJWX), 2002 WL 32377615 (C.D.Cal. Jan. 18, 2002). This case was not selected for publication in the *Federal Supplement*. The resolution of this lawsuit is discussed below.

On June 5, Secretary of Commerce Donald L. Evans responded to the initial request, declining to provide the adjusted data under the Seven Member Rule, stating that “[c]onsistent with the long-standing Executive Branch interpretation of this statute, in which the Congressional Research Service has concurred, we do not believe the statute applies in this circumstance.”¹⁵⁶

Late April 2001: Utah Files Suit Challenging the Use of Count Imputation

On April 25, the State of Utah and other plaintiffs filed a lawsuit alleging that, had the Census Bureau not employed the use of “hot-deck” count imputation in producing the Census 2000 apportionment counts, Utah would have received one additional seat, for a total of four seats in the U.S. House of Representatives.¹⁵⁷

The Census Bureau used count imputation in Census 2000—as it had in prior censuses—to address the problem of missing, incomplete, or contradictory data. Through the processes of status imputation, occupancy imputation, and household-size imputation, the Census Bureau added a total of 1.17 million persons to the Census 2000 apportionment counts.¹⁵⁸ These processes are discussed in detail in the summary of this lawsuit that appears in the “Litigation” section of this chapter.

Utah claimed that count imputation was a form of statistical sampling, which the Supreme Court held earlier in *Department of Commerce v. U.S. House of Representatives* (discussed above) could not be used in producing the apportionment counts.¹⁵⁹ Additionally, Utah claimed that the use of count imputation was in violation of the Apportionment Clause of the Constitution as amended by Section 2 of the Fourteenth Amendment.¹⁶⁰ This case was ultimately decided by the Supreme Court, which issued a June 20, 2002, decision concluding that the use of hot-deck count imputation is neither contrary to the Constitution nor Title 13, U.S. Code, Section 195.¹⁶¹

September 2001: Census Monitoring Board Issues Two Separate Final Reports to Congress

Before its authority expired on September 30, 2001, the CMB concluded its reporting requirements by issuing two reports to Congress, reflecting the differing perspectives of the members appointed by the President and those appointed by Congress.¹⁶² The report authored by the

¹⁵⁶ Donald L. Evans, Secretary, U.S. Department of Commerce, to Rep. Henry A. Waxman, Ranking Minority Member, Committee on Government Reform, U.S. House of Representatives, June 5, 2001.

¹⁵⁷ *Utah v. Evans*, No. 2:01CV00292G, in the U.S.D.C. for the District of Utah, Central Division (*Evans II*), Complaint for Declaratory and Injunctive Relief, ¶ 41. The use of hot-deck count imputation was challenged in connection with the 1980 census in *Orr v. Baldrige*. The district court in that case upheld its use. *Orr v. Baldrige*, No. IP 81604C, slip. op. (S.D.Ind. July 1, 1985). For a summary of the lawsuit, see U.S. Census Bureau, *1980 Census of Population and Housing History, Part E*, PHC80-R-2E (Washington, DC: Government Printing Office, August 1989), pp. 10-8–10-9. Earlier in 2001, the State of Utah and other plaintiffs filed a lawsuit challenging the failure to include Mormon missionaries temporarily residing overseas in the Census 2000 apportionment counts. *Utah v. Evans*, 143 F.Supp.2d 1290, (D.Utah 2001), *affd*, 534 U.S. 1038 (2001) (*Evans I*). Both of these lawsuits filed by the State of Utah are discussed in detail in the “Litigation” section of this chapter.

¹⁵⁸ U.S. Census Bureau, “Initial Research on Count Imputation in Census 2000,” Census 2000 Informational Memorandum No. 110, August 10, 2001, p.1.

¹⁵⁹ Complaint for Declaratory and Injunctive Relief, ¶ 36; *Department of Commerce v. U.S. House of Representatives*, 525 U.S. 316 (1999).

¹⁶⁰ Complaint for Declaratory and Injunctive Relief, ¶ 44. The Apportionment Clause of the Constitution (Article I, Section 2, Clause 3) refers to an “actual Enumeration” to be conducted every 10 years “. . . in such Manner as . . . [Congress] shall by Law direct.”

¹⁶¹ *Utah v. Evans*, 536 U.S. 452 (2002).

¹⁶² In addition to the final letter-report (discussed in the text) they issued to meet their statutory requirement, the congressional members also issued a separate report in September that used Census 2000 data in analyzing the statistical adjustment methodology: “Changing an Assumption: Measuring the Undercount in Census 2000 with an Alternative Post-Strata Creates Different Results; Statistical Adjustment Fails to Correct the Census for Severely Undercounted Neighborhoods: An Analysis of Synthetic Estimation in Blockclusters,” report to Congress, U.S. Census Monitoring Board, congressional members, September 29, 2001, CMBC 76-290.

presidential members of the CMB included 18 general recommendations for improving future censuses. Among these recommendations were the following:

- Every effort should be made to remove partisan politics from the census process.
- Congress and other oversight bodies should have a greater awareness of the consequences of redundant or overlapping oversight.
- The Census Bureau should strive to maintain transparency in its census activities.¹⁶³

In submitting their report to Congress, the presidential members noted that the expert consultants they retained concluded that “. . . a more accurate census would have been achieved by adjusting.”¹⁶⁴

The congressional members' final report included five lessons learned from Census 2000 and six recommendations for improving future censuses. Among these recommendations were the following:

- The use of “indigenous” enumerators and facilitators should be continued and expanded in the future.
- Administrative records should be used to account for those in hard-to-enumerate population groups who might otherwise be missed.
- The postcensus local review program should be reinstated for 2010.¹⁶⁵

With regard to the issue of statistical adjustment, the congressional members stated that their research indicated that “. . . severely undercounted neighborhoods remain severely undercounted—even after statistical adjustment. Severely undercounted congressional districts will also remain severely undercounted.”¹⁶⁶ Thus, they concluded, “. . . the Census Bureau must make an effort to reach every person and to create every opportunity for people to participate in the census.”¹⁶⁷

September 2001: Acting Director Discusses Plans to Make a Decision Regarding Possible Nonredistricting Uses of the Adjusted Data

During the summer of 2001, minority members of the House Census Subcommittee requested information on the plans for a decision in the fall on possible nonredistricting uses of the adjusted data and for the release of the adjusted data at that time.¹⁶⁸ The Census Bureau responded that it still intended to meet its self-imposed October 15 deadline for completing its research and analyses to determine the relative accuracy of the adjusted versus the unadjusted data for non-redistricting uses, but refused to consider releasing the data prior to a determination of their accuracy.¹⁶⁹

¹⁶³ Final report to Congress, U.S. Census Monitoring Board, presidential members, September 1, 2001, pp. 9–10.

¹⁶⁴ Letter accompanying presidential members' final report to Congress, p. 2.

¹⁶⁵ Final letter-report to Congress, U.S. Census Monitoring Board, congressional members, September 1, 2001, CMBC 74-275, pp. 8–12. The postcensus local review program was a 1990 census operation in which local and tribal governments were given an opportunity to review census maps and block-level counts after most data collection operations had been completed to identify possible discrepancies. For more information about the program, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part A*, 1990 CPH-R-2A (Washington, DC: Government Printing Office, October 1993), p. 6-45. Additionally, it should be noted that in February 1999, legislation was introduced to mandate such a program for Census 2000. The bill was approved by the House, but the Senate took no action on it. See the “Legislation” section of this chapter for more information about the bill.

¹⁶⁶ *Ibid.*, p. 13.

¹⁶⁷ *Ibid.*, p. 6.

¹⁶⁸ Reps. William Lacy Clay and Carolyn B. Maloney, U.S. House of Representatives, to William Barron, Jr., Acting Director, U.S. Census Bureau, July 27, 2001.

¹⁶⁹ William G. Barron, Jr., Acting Director, U.S. Census Bureau, letter to Rep. William Lacy Clay, U.S. House of Representatives, September 21, 2001, pp. 2 and 6. (Identical letter sent to Rep. Maloney.)

Earlier, on August 7, the Census Bureau released the ESCAP's research plan.¹⁷⁰ The plan specified the research and analyses the ESCAP would conduct to further assess the accuracy of the adjusted data and to inform the decision regarding nonredistricting uses of the data, including their possible incorporation in Census 2000 sample (long-form) data products, intercensal estimates, and survey controls.¹⁷¹

Mid-October 2001: Further Research Confirms Errors in Adjusted Data Results

The agency conducted extensive analyses throughout the summer of 2001 to inform the October 2001 decision. Much of this work focused on the accuracy of the A.C.E. and Census 2000 data. In addition, the Census Bureau reexamined and revised the DA estimates.

These studies confirmed the serious concerns the ESCAP had identified earlier regarding the accuracy of the A.C.E. estimates. This new research found that the A.C.E. did not account for a large number of census erroneous enumerations, many of which were duplicates, leading to an overstatement of the Census 2000 net undercount by at least 3 million persons. This finding, in conjunction with revisions made to the DA estimates, explained to a large degree the discrepancies between the A.C.E. and DA estimates.¹⁷²

The large numbers of census duplicate enumerations and the A.C.E.'s failure to detect them appeared to be due—at least in part—to response error in obtaining respondents' usual residence. The evaluations of the A.C.E. revealed, for example, that children of divorced or separated parents may have been reported by respondents as members of two different households in the census, the A.C.E., and, to a certain extent, in the studies themselves. Thus, consistent, albeit incorrect, reporting by respondents may have led to errors in the census that were virtually undetectable by the A.C.E.¹⁷³

Given the level of error in the A.C.E. measurement of net coverage, the ESCAP recommended against the use of the adjusted data for nonredistricting purposes. The committee noted that because of this substantial error, revisions to the adjusted data, based on extensive additional review and analyses, would be necessary before any potential uses of the data could be considered.¹⁷⁴

Mid-October 2001: Census Bureau Adopts ESCAP Recommendation Against Adjustment; Releases Limited Revised Estimates of Census 2000 Net Undercount

The Census Bureau adopted the ESCAP's recommendation. Consequently, on October 16, the Acting Director informed the Under Secretary for Economic Affairs of the Department of Commerce that the Census Bureau would release Census 2000 sample data products, intercensal estimates, and survey controls using unadjusted data. However, the Acting Director noted that it was possible further research and analysis could yield revised A.C.E. estimates that could be used for programmatic and other purposes—for example, to improve the accuracy of intercensal estimates in subsequent years.¹⁷⁵

On October 17, the Census Bureau publicly announced the decision not to adjust the Census 2000 sample data products, intercensal estimates, and survey controls. In order to fully explain its decision, the agency released “revised early approximations” of net undercount in Census 2000 for

¹⁷⁰ U.S. Census Bureau, “The Executive Steering Committee for A.C.E. Policy (ESCAP) Research Plan,” memorandum from John H. Thompson, chair, Executive Steering Committee for A.C.E. Policy, to William G. Barron, Jr., Acting Director, August 7, 2001.

¹⁷¹ Intercensal population estimates are produced annually for the nation, states, and counties (and biennially for smaller geographic areas) and are generally used in federal funding allocation formulae in lieu of decennial census figures (except for the year in which the census figures are released) because they reflect ongoing population changes during the decade.

¹⁷² *Federal Register*, Vol. 66, No. 214 (November 5, 2001), p. 56007.

¹⁷³ The discussion in this paragraph is taken from U.S. Census Bureau, Robert E. Fay, “Evidence of Additional Erroneous Enumerations from the Person Duplication Study,” ESCAP II Report No. 9, March 27, 2002, p. 30. A preliminary version of this paper was also released publicly; that version is dated October 26, 2001. Both of these documents (PDF versions) can be accessed from the Census Bureau's Web site at the following page: <<http://www.census.gov/dmd/www/ReportRec2.htm>>

¹⁷⁴ *Federal Register*, Vol. 66, No. 214, p. 56007.

¹⁷⁵ *Ibid.*, p. 56006.

three race/ethnicity groupings and the total population. These revised preliminary estimates were not part of the ESCAP's October 17, 2001, report, but were produced at the request of the Acting Director to illustrate the effect on the A.C.E. estimates of potential future revisions that accounted for the erroneous enumerations not measured by the A.C.E. That is, these revised net undercount estimates were calculated by subtracting the percent of erroneous enumerations not detected by the A.C.E. survey from the original (March 2001) A.C.E. percent net undercount estimates.¹⁷⁶ The Acting Director noted that the revised preliminary estimates demonstrated “. . . a very significant and a very important further reduction in the differential undercount.”¹⁷⁷ He also noted that had the adjusted data been designated as the official redistricting file, the new research results made it apparent that such a decision would have been clearly erroneous.¹⁷⁸

With regard to further work to revise the A.C.E. estimates, the Acting Director provided assurances that the Census Bureau would continue its evaluation of the A.C.E. program and attempt to finalize revised estimates. He also indicated that such research could lead to the use of revised estimates in producing intercensal population estimates later in the decade.¹⁷⁹

Following this second decision against adjustment and given the identified level of error in the adjusted data, the Department of Commerce and the Census Bureau continued to withhold them.¹⁸⁰

2002

January to May 2002: District Court Orders Release of Adjusted Data Pursuant to the “Seven Member Rule” and Denies Reconsideration Motion; Commerce Department Appeals Decision

On January 18, the U.S. District Court for the Central District of California found that the plain language of Section 2954 of Title 5, U.S. Code, the “Seven Member Rule,” required the Secretary to release the adjusted data to the members of the House Committee on Government Reform, and the court ordered him to release the data.¹⁸¹ The Commerce Department filed a motion for reconsideration, which the court denied on March 25.¹⁸² The defendant appealed the decision to the Ninth Circuit Court of Appeals on May 10.¹⁸³ The resolution of this case is discussed below.

Early April 2002: Census Bureau Releases Revised Preliminary Estimates of Net Undercount for Seven Race/Ethnicity Groupings

In April 2002, the Census Bureau released revised preliminary estimates for the total population and seven race/ethnicity groupings; three of these estimates were included in the October 17 release.¹⁸⁴ The methodology used for the October 2001 figures was expanded to produce estimates for additional, specific race/ethnicity groupings. The Census Bureau noted that these data provided support for the agency's expectation that revised A.C.E. estimates would continue to show a differential undercount.

¹⁷⁶ U.S. Census Bureau, John H. Thompson, Preston J. Waite, and Robert E. Fay, “Basis of ‘Revised Early Approximation’ of Undercounts Released Oct. 17, 2001,” ESCAP II Report No. 9a, October 26, 2001. A PDF version of this document is available at <<http://www.census.gov/dmd/www/ReportRec2.htm>>. The “revised early approximations” for the three race/ethnicity groupings and the total population are shown in Table 11-3 alongside estimates for the same groupings from the original (March 2001) A.C.E. data.

¹⁷⁷ Transcript of ESCAP press conference, held at the U.S. Census Bureau, October 17, 2001, Federal News Service, Washington, DC, pp. 3–4.

¹⁷⁸ *Ibid.*, p. 5.

¹⁷⁹ *Ibid.*, pp. 4–5.

¹⁸⁰ See, for example, William G. Barron, Jr., Acting Director, U.S. Census Bureau, to The Honorable Jody Richards, Speaker of the House, Kentucky General Assembly, December 14, 2001, p. 2.

¹⁸¹ *Waxman v. Evans*, No. CV014530LGB (AJWX), 2002 WL 32377615 (C.D.Cal. Jan. 18, 2002). This case was not selected for publication in the *Federal Supplement*.

¹⁸² Brief for Appellant, Statement of Jurisdiction, *Waxman v. Evans*, 2002 WL 32115555, at *1 (9th Cir. May 21, 2002) (No. 02-55825). This case was not selected for publication in the *Federal Reporter*.

¹⁸³ *Ibid.*

¹⁸⁴ U.S. Census Bureau, “Revised Preliminary Estimates of Net Undercounts for Seven Race/Ethnicity Groupings,” DSSD A.C.E. Revision II Memorandum Series PP-2. A PDF version of this memorandum can be accessed from the A.C.E. Revision II page on the Census Bureau's Web site at <<http://www.census.gov/dmd/www/ace2.html>>. The April 2002 estimates of percent net undercount are presented in Table 11-4.

Based on this initial work, the Census Bureau embarked on a comprehensive research effort to develop a methodology for revising the A.C.E. estimates. Through this research, dubbed “A.C.E. Revision II,” which concluded the following spring, the Census Bureau sought to determine if the additional research and analysis would result in improved estimates that could be used for programmatic purposes. Specifically, the agency planned to investigate producing revised estimates and to determine if utilizing those estimates to adjust the base used to produce annual and biennial intercensal population estimates would improve the accuracy of those data.

September 2002: Ninth Circuit Court of Appeals Upholds District Court Decision in City of Los Angeles Suit

On September 27, the U.S. Court of Appeals for the Ninth Circuit upheld the district court’s decision in the *City of Los Angeles* lawsuit challenging the Secretary’s redistricting data adjustment decision. The Ninth Circuit Court ruled that:

[b]ecause Congress conditioned the use of sampling on the Secretary’s consideration of its feasibility, Section 195 does not create a presumption in favor of statistical adjustment of the census, nor does it require the Secretary to consider the adjusted data as the default data for Census 2000. Instead, Section 195 grants broad discretion upon the Secretary to “consider” as an initial matter what uses of sampling are ‘feasible.’¹⁸⁵

The court concluded that “. . . Secretary Evan’s interpretation of the statute, as permitting him to consider accuracy as a component of feasibility, was a permissible construction of the statute.”¹⁸⁶

October to December 2002: Ninth Circuit Court Upholds District Court FOIA Ruling; Census Bureau Makes Adjusted Data Available to Any Requester

On October 8, the U.S. Court of Appeals for the Ninth Circuit, in *U.S. Department of Commerce v. Carter*, upheld an order releasing Census 2000 adjusted block-level data under the Freedom of Information Act (FOIA).¹⁸⁷ The lower court had ruled that the adjusted block-level data were not protected under Exemption 5 of the FOIA as predecisional nor deliberative.¹⁸⁸ The department subsequently released the data to the plaintiffs.¹⁸⁹ Accordingly, the Ninth Circuit Court of Appeals vacated the district court judgment in *Waxman v. Evans* and remanded the case to the district court with instructions to dismiss the appeal as moot.¹⁹⁰

The Census Bureau anticipated additional requests for the Census 2000 adjusted block-level data, given the Ninth Circuit decision in *Carter*. Consequently, the agency developed a process for providing the data to requesters. Requesters were required to acknowledge receipt of a caveat that stated, in part:

. . . the adjusted estimates were determined to be so severely flawed that all potential uses of these data would be inappropriate. Accordingly, the Department of Commerce deems that these estimates should not be used for any purpose that legally requires use of data from the decennial census and assumes no responsibility for the accuracy of the data for any purpose whatsoever. The Department, including the Census Bureau, will provide no assistance in the interpretation or use of these numbers.¹⁹¹

¹⁸⁵ *City of Los Angeles v. U.S. Department of Commerce*, 307 F.3d 859, 871 (9th Cir. 2002).

¹⁸⁶ *Ibid.*, p. 877. The “Litigation” section of this chapter contains a more detailed discussion of this case.

¹⁸⁷ *U.S. Department of Commerce v. Carter*, 307 F.3d 1084 (9th Cir. 2002). The plaintiffs/FOIA requesters were Oregon state senators. This case is also discussed in the “Freedom of Information Act Requests” and “Litigation” sections of this chapter.

¹⁸⁸ *Carter v. U.S. Department of Commerce*, 186 F.Supp.2d 1147 (D.Or. Nov. 20, 2001).

¹⁸⁹ U.S. Census Bureau, “Requests for Adjusted Data from Census 2000,” memorandum for executive staff and all divisions, from Preston Jay Waite, Associate Director for Decennial Census, December 6, 2002.

¹⁹⁰ *Waxman v. Evans*, Fed.Appx. 84, 2002 WL 31748590, at *1 (9th Cir. Dec. 6, 2002). This case was not selected for publication in the *Federal Reporter*. It is discussed in more detail in the “Litigation” section.

¹⁹¹ “Requests for Adjusted Data from Census 2000,” December 6, 2002 (attachment).

March 2003: Census Bureau Produces Revised A.C.E. Estimates, But Decides That Intercensal Estimates Will Continue to Use Unadjusted Census 2000 Base

By March 2003, the Census Bureau completed the research work on A.C.E. Revision II. This work resulted in the production of revised estimates of net coverage error in Census 2000.¹⁹² The A.C.E. Revision II estimate of percent net undercount for the total household population in Census 2000 was -0.49, or a national net overcount of approximately one-half of 1 percent. In addition to national-level revised estimates of percent net undercount for major race/ethnicity, tenure, and age/sex groupings, the agency produced and released revised estimates for states, counties, and places.

For the first time, the Census Bureau incorporated an adjustment for correlation bias in the estimates produced by the dual system estimation methodology. Explained briefly, correlation bias is the bias in the dual system estimates because of the tendency for people who are missed in the census to be more likely to be missed by the coverage measurement survey as well, thus generally resulting in understated estimates of net undercount. By way of example, the A.C.E. Revision II estimate of percent net undercount for the total population without the adjustment for correlation bias was -1.12 percent, as compared to -0.49 percent, which incorporated the adjustment. That is, the estimate of net overcount was adjusted downward (brought closer to zero) by including an adjustment for correlation bias.

While the Census Bureau noted that the A.C.E. Revision II estimates represent the most accurate assessment of Census 2000 coverage available, the agency also noted technical concerns regarding the limitations of the methodology and the quality of the data. These included uncertainty about the adjustment for correlation bias; concerns about errors from synthetic estimation;¹⁹³ and inconsistencies between DA estimates and A.C.E. Revision II estimates of the coverage of children. Consequently, the Census Bureau determined that the official Census 2000 results would continue to be used as the base for producing the intercensal estimates.¹⁹⁴

The A.C.E. Revision II research reaffirmed the Census Bureau's confidence in the decisions made in March and October of 2001 to release only the unadjusted data and confirmed that releasing the adjusted data would have been a grave error. Additionally, this work also provided valuable information in understanding census coverage that has enabled the Census Bureau to make improvements in census programs and operations and to improve its methods for estimating coverage in developing an appropriate coverage measurement program for the 2010 Census.

¹⁹² The A.C.E. Revision II estimates of percent net undercount for the total population and major race/ethnicity groups are presented in Table 11-5.

¹⁹³ Synthetic estimation error, explained briefly, is the error introduced at lower geographic levels when the assumption that the net undercount being geographically uniform within post-strata is not correct. See the A.C.E. section of Chapter 10 ("Testing, Experimentation, Evaluation, and Coverage Measurement Programs") for additional discussion.

¹⁹⁴ U.S. Census Bureau, "Decision on Intercensal Population Estimates," March 12, 2003, p. 1. The Census Bureau has made publicly available a vast amount of documentation related to its decision and the A.C.E. Revision II research. The following Web page provides access to this documentation: <<http://www.census.gov/dmd/www/ace2.html>>.

Table 11-1.

Preliminary Estimated Coverage of Census 2000 Based on the Accuracy and Coverage Evaluation (A.C.E.) Survey: February 14, 2001

Estimation grouping	Net undercount (percent)	
	Low estimate	High estimate
Total population in households	0.96	1.40
Race and Hispanic Origin		
American Indian and Alaska Native		
On reservation	2.77	6.71
Off reservation	1.08	5.47
Hispanic origin (of any race)	2.22	3.48
Black or African American (not Hispanic)	1.60	2.73
Native Hawaiian and Other Pacific Islander (not Hispanic)	0.05	9.16
Asian (not Hispanic)	-0.09	2.01
White or Some Other Race (not Hispanic)	0.44	0.90

Notes that accompanied table at its release: The race and Hispanic categories shown in this table represent estimation groupings used in developing estimates based on the A.C.E. survey and do not conform with race and Hispanic categories that will appear in the redistricting (P.L. 94-171) files and other Census 2000 data products. In developing the estimation groupings used to evaluate the coverage of Census 2000, the principal consideration was to combine people who were expected to have the same probability of being counted in Census 2000. Consequently, the race and Hispanic origin groupings used to create the A.C.E. estimates of coverage are exceedingly complex. For a complete description of the estimation groups, see DSSD Memorandum Q-37, which will be provided on request.

In general, American Indians and Alaska Natives (AIAN) are included in that category, regardless of whether they marked another race or are Hispanic. A few exceptions apply, especially for those who do not live on a reservation, on trust lands, or in an AIAN statistical area.

Similarly, Native Hawaiians and Other Pacific Islanders (NHPI) generally are included in that category, unless they lived outside of Hawaii and marked more than one race or marked Hispanic.

Hispanics are mostly in that category, unless they marked AIAN and lived on a reservation, on trust lands, or in an AIAN statistical area, or marked NHPI and lived in Hawaii.

People who marked Black or African American are generally in that category unless they fell in the categories described above; similarly those who marked Asian are generally in that category, unless they fell in the categories described above.

The final category includes most people who marked only White or only Some Other Race or marked three or more races but did not fall into the categories described above.

The data in this table contain sampling and nonsampling error.

Source: U.S. Department of Commerce, "Preliminary Estimates Show Improvement in Census 2000 Coverage," *U.S. Census Bureau News*, February 14, 2001, CB01-CN.03 (table reproduced in part).

Table 11-2.

Percent Net Undercount for Major Groups Based on the Accuracy and Coverage Evaluation (A.C.E.) Survey: March 1, 2001

Estimation grouping	Net undercount (percent)	Standard error (percent)
Total population in households	1.18	0.13
Race and Hispanic Origin		
American Indian and Alaska Native		
On reservation	4.74	1.20
Off reservation	3.28	1.33
Hispanic origin (of any race)	2.85	0.38
Black or African American (not Hispanic)	2.17	0.35
Native Hawaiian and Other Pacific Islander (not Hispanic)	4.60	2.77
Asian (not Hispanic)	0.96	0.64
White or Some Other Race (not Hispanic)	0.67	0.14

Notes that accompanied table at its release: The race and Hispanic categories shown in this table represent estimation groupings used in developing estimates based on the A.C.E. Survey and do not conform with race and Hispanic categories that will appear in the redistricting (P.L. 94-171) files and other Census 2000 data products. In developing the estimation groupings used to evaluate the coverage of Census 2000, the principal consideration was to combine people who were expected to have the same probability of being counted in Census 2000. Consequently, the race and Hispanic origin groupings used to create the A.C.E. estimates of coverage are exceedingly complex. For a complete description of the estimation groups, see DSSD Memorandum Q-37, which will be provided on request.

In general, American Indians and Alaska Natives (AIAN) are included in that category, regardless of whether they marked another race or are Hispanic. A few exceptions apply, especially for those who do not live on a reservation, on trust lands, or in an AIAN statistical area.

Similarly, Native Hawaiians and Other Pacific Islanders (NHPI) generally are included in that category, unless they lived outside of Hawaii and marked more than one race or marked Hispanic.

Hispanics are mostly in that category, unless they marked AIAN and lived on a reservation, on trust lands, or in an AIAN statistical area, or marked NHPI and lived in Hawaii.

People who marked Black or African American are generally in that category unless they fell in the categories described above; similarly those who marked Asian are generally in that category, unless they fell in the categories described above.

The final category includes most people who marked only White or only Some Other Race or marked three or more races but did not fall into the categories described above.

The data in this table contain sampling and nonsampling error.

Source: *Federal Register*, Vol. 66, No. 46 (March 8, 2001), pp. 14007-08 (table reproduced in part).

Table 11-3.

Revised Preliminary Estimates of Percent Net Undercount: October 17, 2001

Estimation grouping	Accuracy and Coverage Evaluation		Revised early approximation	
	Percent	Standard error	Percent	Standard error
Total	1.18	(0.13)	0.06	(0.18)
Non-Hispanic Black	2.17	(0.35)	0.78	(0.45)
Hispanic	2.85	(0.38)	1.25	(0.54)
All others	0.73	(0.14)	-0.28	(0.20)

Note that accompanied table at its release: The standard errors of our early approximations are quite high, but further research will reduce them. These early approximations are preliminary. We believe our final estimates will be very similar to these early approximations and will show smaller sampling errors.

Source: Table reproduced from press kit materials for the following news release: U.S. Department of Commerce, "Statement of Acting Census Bureau Director William Barron Regarding the Adjustment Decision," U.S. Census Bureau News, October 17, 2001, CB01-CS.08.

Table 11-4.
Revised Preliminary Estimates of Percent Net Undercount: April 4, 2002

Estimation grouping	Estimate	Standard error
Total	0.06	0.18
Black or African American	0.78	0.45
Hispanic origin	1.25	0.54
Asian and Pacific Islander	-0.06	0.90
Asian (not Hispanic)	-0.31	0.91
Native Hawaiian and Other Pacific Islander (not Hispanic)	4.64	2.79
American Indian and Alaska Native	3.44	1.60
White or Some Other Race (not Hispanic)	-0.33	0.21

Notes: A negative estimate indicates an overcount.

The race and Hispanic categories shown in this table represent estimation groupings used in developing estimates based on the Accuracy and Coverage Evaluation survey and do not conform with race and Hispanic categories that appeared in the redistricting (P.L. 94-171) files and other Census 2000 data products. For a complete description of the estimation groups, see DSSD Memorandum Q-37.

In general, American Indians and Alaska Natives (AIAN) are included in that category, regardless of whether they marked another race or are Hispanic. A few exceptions apply, especially for those who do not live on a reservation, on trust lands, or in an AIAN statistical area.

Similarly, Native Hawaiians and Other Pacific Islanders (NHPI) generally are included in that category, unless they lived outside of Hawaii and marked more than one race or marked Hispanic.

Hispanics are mostly in that category, unless they marked AIAN and lived on a reservation, on trust lands, or in an AIAN statistical area, or marked NHPI and lived in Hawaii.

People who marked Black or African American are generally in that category unless they fell into the categories described above; similarly those who marked Asian are generally in that category, unless they fell into the categories described above.

The final category includes most people who marked only White or only Some Other Race or marked three or more races but did not fall into the categories described above. The White and Some Other Race group in this table is different than the Other group in the October 2001 estimates.

The data in this table contain sampling and nonsampling error. The revised preliminary estimates have high variances.

Source: U.S. Census Bureau, "Revised Preliminary Estimates of Net Undercounts for Seven Race/Ethnicity Groupings," DSSD A.C.E. Revision II Memorandum Series PP-2, April 4, 2002, Table 1, p. 3 (table reproduced in part).

Table 11-5.
Accuracy and Coverage Evaluation Revision II Estimates of Percent Net Undercount: March 12, 2003

Estimation grouping	Net undercount (percent)	Standard error (percent)
Total	-0.49	0.20
Race and Hispanic Origin		
American Indian and Alaska Native		
On reservation	-0.88	1.53
Off reservation	0.62	1.35
Hispanic Origin (of any race)	0.71	0.44
Black or African American (not Hispanic)	1.84	0.43
Native Hawaiian and Other Pacific Islander	2.12	2.73
Asian (not Hispanic)	-0.75	0.68
White or Some Other Race (not Hispanic)	-1.13	0.20

Notes: All net undercounts are for the household population. A negative net undercount denotes a net overcount.

The A.C.E. Revision II estimates of percent net undercount incorporate an adjustment for correlation bias using the "Two-Group" model.

Source: U.S. Census Bureau, "Decision on Intercensal Population Estimates," March 12, 2003, Table 3 (table reproduced in part), p. 10 (PDF version).

FREEDOM OF INFORMATION ACT REQUESTS

The Freedom of Information Act

The Freedom of Information Act (FOIA), Title 5, U.S. Code, Section 552, enacted in 1966, provides individuals with the right to obtain and access federal government agency documents, with the exception of those that are protected from disclosure by one of the act's exemptions or exclusions. The general intent of the FOIA is to provide openness and transparency in government operations, while relying on exemptions or exclusions to protect validly confidential information.

FOIA exemptions protect from disclosure documents or portions thereof containing the following information: (1) national security, defense, and foreign policy classified information; (2) information pertaining only to internal agency personnel rules and practices; (3) information specifically protected from disclosure by other statutes; (4) information that is privileged or confidential commercial proprietary information or trade secrets; (5) information contained in an inter- or intra-agency document that is deliberative and predecisional in nature or is attorney-client privileged or constitutes attorney work product; (6) information pertaining to individuals of a personal privacy nature, such as that contained in medical and personnel files; (7) information prepared for law enforcement purposes; (8) information pertaining to the regulation and oversight of financial institutions; and (9) geological and geophysical information.

If a government agency fails to respond to a requester within the statute's prescribed deadline (20 working days), withholds information from disclosure pursuant to one or more of the nine aforementioned exemptions, or states that there are no responsive documents, the requester may file an appeal with the agency's FOIA appeals officer. (For the Census Bureau, the appeals officer is the assistant general counsel for administration, Office of General Counsel, U.S. Department of Commerce.) If the appeals officer's decision is unfavorable, the requester may appeal that decision by filing suit in federal district court (Title 5, U.S. Code, Section 552(a)(4)(B)).

The Census Bureau and the FOIA

The Census Bureau receives and responds to a number of FOIA requests each year. Typically this number increases dramatically in the census year and during the years immediately preceding and following the census year (for the 2000 Census, between 1997 and 2002), as public interest in the census and matters pertaining to the Census Bureau is heightened. Over this period, the Census Bureau received over 1,700 census-related requests—an average of approximately 280 requests per year. This compares to an annual average of approximately 175 requests received in the years outside of this 6-year period.

Census 2000-related FOIA requests can be grouped into three categories. The first category includes those relating to adjustment issues, including the redistricting data adjustment decision and release of the adjusted data. The Census Bureau received approximately 25 such requests. The second category includes requests pertaining to nonadjustment-related programs or operations. This category comprised nearly 80 requests. The third category deals with personnel issues and with large contracts for services such as advertising and data capture. This third category encompassed nearly 450 requests.

Requests Pertaining to Adjustment Issues

Background. One of the most contentious technical, legal, and political issues related to the decennial census over the past few decades is whether to use statistical sampling and estimation methodology to adjust raw data counts to correct for net coverage errors. As it had with the 1990 census, the Census Bureau conducted a coverage measurement survey (the Accuracy and Coverage Evaluation, or A.C.E.) in connection with Census 2000 to measure net coverage error and to assess the feasibility of adjusting the data. Legal challenges by opponents of sampling resulted in a 1999 Supreme Court decision, concluding that the use of statistical sampling (and thus statistical adjustment based on sampling) to produce the state population numbers for apportionment of

the U.S. House of Representatives was precluded by the Census Act (Title 13, U.S. Code), specifically Section 195.¹⁹⁵ Because the Supreme Court concluded that Section 195 expressly prohibited sampling for purposes of apportionment of the U.S. House of Representatives and Section 195 made no mention of its use to produce numbers for redistricting or other purposes—and the Supreme Court did not explicitly address such uses in its opinion—the Clinton administration interpreted Section 195 to permit statistical adjustment for such purposes, if feasible.¹⁹⁶

In March 2001, Secretary of Commerce Donald Evans determined that the unadjusted data were the most accurate data and would be the official redistricting data, and these were the only data released to the public. During the months preceding and following the Census Bureau's recommendation on adjustment and the Secretary of Commerce's decision, the department received a number of FOIA requests for documents related to these two events. Additionally, in the months following the Secretary's adjustment decision, both the Department of Commerce and the Census Bureau received requests for the Census 2000 adjusted block-level data. These FOIA requests are discussed in more detail below. The adjusted block-level data had been prepared in the event the Secretary of Commerce decided in favor of adjustment. The data were available for release to states and localities within the deadline stipulated in Public Law (P.L.) 94-171 (within 1 year following the decennial census date).

Requests related to the adjustment methodology and decision-making process. In the months surrounding the redistricting data adjustment decision, the Census Bureau and the Commerce Department received numerous FOIA requests from state and local government officials, various print media, and others, for documents relating to the decision and relevant background information. Of particular note were a request from the ranking minority member of the U.S. House Subcommittee on the Census and a series of requests from a law firm representing the city of Los Angeles. These requests pertained to, among other things, the A.C.E. program methodology; the bases for evaluating the adjusted versus the unadjusted data; documents produced for and/or reviewed by the Executive Steering Committee for Accuracy and Coverage Evaluation Policy (ESCAP)¹⁹⁷; documents used by Census Bureau Acting Director William Barron in reaching his decision concurring with the ESCAP recommendation against adjustment; documents provided to Secretary of Commerce Donald Evans and/or his transition team relating to census adjustment; and documents used by Secretary Evans in reaching his decision to designate the unadjusted data as the official redistricting (P.L. 94-171) data and withhold the adjusted data.¹⁹⁸

Prior to the Secretary's decision, the city of Los Angeles (and other plaintiffs) filed suit to challenge the new administration's changes regarding the Census 2000 redistricting data adjustment decision-making process.¹⁹⁹ Following the Secretary's decision, the plaintiffs amended their complaint, seeking a court order releasing the adjusted data as the official redistricting data.²⁰⁰

Much of the documentation responsive to the city of Los Angeles and similar requests was available from the Census Bureau's Web site, but some relevant documents given to Secretary Evans by the Census Bureau were withheld as predecisional and deliberative (Exemption 5 of the FOIA). Additionally, the extremely broad nature of some of the requests from the city of Los Angeles required the Census Bureau to process those requests on an ongoing basis, conducting its search and review activities and providing documents to the requester in a periodic manner, activities which, for some requests, continued for over a year.

Requests for release of the adjusted data. The most notable FOIA request for the Census 2000 adjusted block-level data was an April 2001 request from two Democratic senators from the

¹⁹⁵ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999).

¹⁹⁶ The section of this chapter entitled "The Debate Over the Use of Sampling" chronicles the challenges to the planned uses of sampling in Census 2000.

¹⁹⁷ ESCAP was a committee of senior Census Bureau officials charged with making a recommendation to the Director regarding whether the official redistricting data should incorporate a statistical adjustment.

¹⁹⁸ The ESCAP process, including the committee's report and recommendation, the Acting Director's concurrence document, and the Secretary of Commerce's decision, are discussed in more detail in "The Debate Over the Use of Sampling" section.

¹⁹⁹ The original rule defining the decision-making framework and the subsequent rule (superceding the earlier rule), promulgated by the new administration in February 2001, are discussed in "The Debate Over the Use of Sampling" section.

²⁰⁰ This lawsuit, *City of Los Angeles v. Evans*, is summarized in the "Litigation" section of this chapter.

Oregon state legislature, Susan Castillo and Margaret Carter, asking for the adjusted block-level data for the entire country. They requested the data for redistricting and other purposes and indicated that they would share the data for other states with legislators in those states, for similar purposes. In May 2001, the Census Bureau denied the request, citing the deliberative process privilege in Exemption 5 of the FOIA, stating that the adjusted block-level data were “predecisional” and “deliberative” and were related to an intradepartmental recommendation not to statistically adjust the official redistricting data, a recommendation accepted by the Secretary of Commerce. The state senators appealed the denial to the Office of General Counsel of the Department of Commerce, and in June 2001, the denial was upheld.

The state senators subsequently filed suit in the U.S. District Court for the District of Oregon, which held that the adjusted data must be released. The Department of Commerce appealed to the U.S. Court of Appeals for the Ninth Circuit. That court, in *U.S. Department of Commerce v. Carter*, upheld the district court decision ordering the release of the Census 2000 adjusted block-level data under the FOIA.²⁰¹

The Census Bureau and Department of Commerce received many other FOIA requests for the adjusted data (usually at the block-level) from state and local government officials and various print media.²⁰² Following the Secretary’s decision, A.C.E. results below the national level were not publicly released, and all such FOIA requests, and subsequent appeals, were denied, citing the deliberative process privilege in Exemption 5 of the FOIA.²⁰³

Requests Pertaining to Nonadjustment-Related Programs or Operations

Requests related to programs/operations legally challenged by the State of Utah.

The State of Utah and other plaintiffs filed two lawsuits relating to Census 2000 programs/operations.²⁰⁴ In the first *Utah v. Evans*—this case is known as *Evans I*—which was filed on January 10, 2001, Utah challenged the Census Bureau policy of including overseas federal civilian and military employees and their dependents in Census 2000 for apportionment purposes but excluding thousands of missionaries of the Church of Jesus Christ of Latter-day Saints (the LDS Church) who were temporarily serving abroad when Census 2000 was conducted. The State of Utah contended that had the overseas LDS Church missionaries been included in, or the overseas federally affiliated households excluded from, the apportionment counts, it would have received a fourth seat in the U.S. House of Representatives. Acting on behalf of the plaintiffs, Brigham Young University professor Lara Wolfson made a FOIA request for (among other things) the counts of overseas military and federal civilian personnel and their resident dependents that the Census Bureau received from the various departments and agencies. She also requested the number of persons included in these counts that were not allocated to states for calculating the apportionment numbers. The Census Bureau provided the requested data. Further, Professor Wolfson requested the records from which the counts of overseas military personnel and their dependents were obtained; however, the Department of Defense had given the Census Bureau only the counts and state affiliations for these individuals.

On November 26, 2001, the Supreme Court issued a summary affirmation of the April 17, 2001, judgment of the three-judge panel of the district court in favor of defendants.

Utah and co-plaintiffs filed their second lawsuit—*Utah v. Evans (Evans II)*—on April 25, 2001. The state challenged the use of “hot-deck” count imputation in producing the Census 2000 apportionment counts, claiming that had it not been used, the state would have increased its number of seats in the U.S. House of Representatives from three to four. Among other things, Utah alleged that the use of count imputation was illegal, claiming that it was a form of statistical sampling,

²⁰¹ *U.S. Department of Commerce v. Carter*, 307 F.3d 1084 (9th Cir. 2002). This case is summarized in the “Litigation” section.

²⁰² The series of FOIA requests made on behalf of the City of Los Angeles discussed above included a request for the adjusted block-level data.

²⁰³ One such request pertained to the adjusted population counts for 38 jurisdictions in Texas. The denial of this request was also litigated in federal court, and the case, *Cameron County, Texas v. Evans*, is summarized in the “Litigation” section.

²⁰⁴ For more information regarding these cases, see the “Litigation” section.

which, as noted earlier, the Supreme Court concluded could not be used in producing the apportionment counts.²⁰⁵ In connection with this second suit, a law firm representing the plaintiffs requested under the FOIA two technical reports relating to Census 2000 operations and one report pertaining to 1990 census imputation procedures. These documents were provided to the requester. The Supreme Court eventually upheld the Census Bureau's use of "hot-deck" count imputation.²⁰⁶

Requests by the City of Los Angeles relating to the Census 2000 service-based enumeration (SBE). Between June 2001 and May 2002, the Office of the City Attorney of Los Angeles and a law firm (Gibson, Dunn & Crutcher) representing the city each sent a broad request to the Census Bureau for information about, and data relating to, the conduct of the Census 2000 SBE in the city and county of Los Angeles. The SBE entailed enumeration of persons who were using services established to assist the very poor, for example, soup kitchens, homeless shelters, etc. The requesters sought all documents relating to the Census Bureau's dissemination of "homeless" data to the public as well as all documents relating to its decision not to publish a Census 2000 homeless count.

In a July 25, 2001, follow-up letter clarifying the earlier requests, Gibson, Dunn & Crutcher requested ". . . the breakdown of the other noninstitutionalized group quarters' category into its 6 [categories 701–706] component parts for Los Angeles County, by block, block-group or tract [*sic*], at the lowest geographic level possible."²⁰⁷ The referenced categories comprised the components of the SBE. That is, the SBE enumerated people at the following locations: emergency and transitional shelters (701); shelters for children who are runaways, neglected, or without conventional housing (702); shelters for abused women (or shelters against domestic violence) (703); soup kitchens (704); regularly scheduled mobile food vans (705); and targeted nonsheltered outdoor locations (706).²⁰⁸

The Census Bureau responded that the requested tabulation did not exist and explained that FOIA case law does not require the creation of "new documents" from data stored on computers, the determining factor being whether "substantial reprogramming" was required in order to create documents or records that otherwise do not exist.²⁰⁹ The Census Bureau concluded that this request constituted the creation of a new document and, therefore, denied the request for the specified tabulation.

In responding to the other items of the requests, the Census Bureau referred the requesters to its Web site and provided documentation of the extensive research it carried out throughout the decade regarding the most effective and appropriate methods for enumerating persons without conventional housing. The Census Bureau also provided copies of many reports, publications, memoranda, and letters referencing the agency's plans for the enumeration of, and dissemination of Census 2000 data pertaining to, persons without conventional housing and emphasizing that it never intended to produce a count of the "homeless" population as that term is commonly understood. Additionally, the Census Bureau withheld portions of several "predecisional" and "deliberative" (Exemption 5) documents pertaining to internal deliberations regarding the use of the SBE methodology and/or how the data would be aggregated for publication purposes.

²⁰⁵ *Department of Commerce v. U.S. House of Representatives*, 119 S.Ct. 765 (1999).

²⁰⁶ *Utah v. Evans*, 536 U.S. 452 (2002).

²⁰⁷ Wayne M. Barsky, Gibson, Dunn & Crutcher, to Gerald Gates, Chief, Policy Office, U.S. Census Bureau, July 25, 2002.

²⁰⁸ For more information about the Census 2000 SBE, see the "Group Quarters Enumeration" section of Chapter 5, "Data Collection." For information regarding the data products relating to the SBE, see the "Data Products Pertaining to Special Populations" section of Chapter 9, "Data Products and Dissemination."

²⁰⁹ The agency also later noted in its court filings (*City of Los Angeles v. U.S. Department of Commerce*, No. 02-9122 WMB, in the U.S.D.C. for the Central District of California, Western Division, Defendant's Reply in Support of Defendant's Motion for Summary Judgment, September 10, 2003, p. 11, fn. 4) relating to the ensuing FOIA lawsuit that even if the Census Bureau were to produce such a tabulation at the specified geographic levels, the tabulation would have to be reviewed to determine whether the confidentiality provisions of Title 13 would permit its release. If these provisions would prohibit the release of the specified tabulation—because of the risk that the data pertaining to a particular respondent could be identified—then the Census Bureau would be obligated to withhold it and claim Exemption 3 of the FOIA as the basis for doing so. Exemption 3 pertains to information specifically protected from disclosure by other statutes—in this case, Title 13. However, given that the Census Bureau would first have to create the tabulation in order to conduct its Title 13 confidentiality review, as an initial FOIA consideration, the agency contended that it was not required to create the tabulation.

In August 2002, Gibson, Dunn & Crutcher appealed the Census Bureau's refusal to produce and release the requested tabulation and its withholding of portions of documents under Exemption 5 of the FOIA. Stating that the appeal was not timely filed, the Office of General Counsel of the Department of Commerce denied it. The City of Los Angeles proceeded to file suit in the U.S. District Court for the Central District of California, Western Division, *City of Los Angeles v. U.S. Department of Commerce* (No. 02-9122 WMB). The resolution of this lawsuit is discussed in the "Litigation" section of this chapter.

Other requests pertaining to nonadjustment-related programs or operations. In addition to those summarized above, the Census Bureau received approximately 75 other requests regarding Census 2000 programs or operations that did not relate to adjustment issues. Among these were requests pertaining to jurisdictions participating in the Local Update of Census Addresses (LUCA) program²¹⁰; operational data or published population and/or housing data for particular counties and/or municipalities; and Count Question Resolution (CQR) program issues or cases.²¹¹

Requests Regarding Decennial Personnel Issues or Contracts

Requests pertaining to decennial personnel issues. The magnitude of decennial hiring—over 800,000 temporary appointments nationwide in year 2000 alone—resulted in the Census Bureau receiving and processing a large number of Census 2000 personnel-related FOIA requests. The Census Bureau responded to approximately 350 such requests.

Many of these requests were submitted by decennial census applicants and personnel who were seeking information regarding their nonselection or adverse actions taken against them. Some requesters asked for copies of administrative guides and manuals relating to the procedures for recruiting, testing, and hiring temporary decennial census employees. Some applicants sought information regarding their employment applications, tests they took, or their interviews, including criteria for selection.

In some cases, requesters sought applicant/personnel records of other individuals, and in responding to these requests, the Census Bureau complied with the relevant provisions of the Privacy Act and FOIA (Exemption 6—see the beginning of this section) to protect the privacy rights and interests of the individuals to whom the records pertained. The Privacy Act (Title 5, U.S. Code, Section 552a) provides protection for records pertaining to individuals that the government maintains and has within its possession. Disclosure of these records is prohibited except in limited circumstances and for limited uses. Generally, under the Privacy Act, an individual may gain access to and/or obtain copies of his or her own records, such as applicant/personnel records. With regard to such requests, the Census Bureau requires—in keeping with Department of Commerce regulations—that requesters include a signed, notarized authorization before it will release the records.

A large subset of personnel-related requests—roughly 60 percent—pertained to the criminal background security checks the Census Bureau conducts of its job applicants. These included requests for documentation regarding, or generated as a result of, this process.

Requests for documents relating to decennial census contracts. In Census 2000, many operations that were previously conducted by Census Bureau employees were contracted out to the private sector. Increased public interest in and attention to the census during the period leading up to and immediately following Census 2000 corresponded with a sharp increase in the number of FOIA requests regarding contracts relating to the programs and operations of Census 2000.

²¹⁰ The LUCA program was a precensus activity, authorized by Title 13, U.S. Code, Section 16, in which the Census Bureau worked with local and tribal governments to improve the accuracy and completeness of the agency's Census 2000 address list. This program is described in detail in Chapter 8, "Addresses and Questionnaire Printing and Mailing."

²¹¹ The CQR program was an administrative review program that handled challenges to particular official Census 2000 counts of housing units and group quarters population, focusing primarily on the geographic misplacement of data actually collected in the census—it did not involve reenumeration or adjustment of data. The program is described in more detail in Chapter 9, "Data Products and Dissemination."

During this period, the Census Bureau received well over 80 requests for contracts or contract-related documents. These included requests for documents pertaining to some of the largest of the Census 2000 contract awards, which were for the following services:

- Development of DCS 2000, the system used for the imaging and data capture of the Census 2000 questionnaires.
- Locating and leasing buildings to house the data capture centers, and hiring and managing the employees who performed the data capture.
- Purchasing computer hardware for the regional census centers and the local census offices.
- Telephone questionnaire assistance services (800 telephone number) and telephone interviewing of respondents.
- Developing and implementing an advertising campaign for Census 2000, including creating the message and logo and placing advertisements on television, radio, and in print media.
- Developing and implementing a self-service Internet-based system for the dissemination of Census 2000 data products and other tabulations.

Many requests for documents regarding these awarded contracts came from unsuccessful bidders. However, confidential business information is protected from disclosure by Exemption 4 of the FOIA.²¹² Thus, the Census Bureau FOIA Office (in accordance with law and Commerce Department regulation) contacts the relevant contractor before releasing contract-related documentation that could contain information to be withheld under Exemption 4 and provides an opportunity for the contractor to identify any information considered to be confidential proprietary information. To the extent the Census Bureau concurs in the contractor's designation, such information is withheld.

LITIGATION

1990 Census Litigation

Three lawsuits relating to the 1990 decennial census remained unresolved at the time (September 1995) the 1990 census history chapter on litigation went to print.²¹³ Summaries of these cases are provided before the Census 2000 lawsuits are discussed.

Wisconsin v. City of New York.²¹⁴ This case was the principal lawsuit seeking an adjustment of the 1990 census counts and was filed in advance of the census itself. In October 1987, the Department of Commerce issued a press release stating that it did not intend to adjust the 1990 census for undercounts and overcounts. As a result, a number of states, counties, cities (including New York), organizations, and individual citizens from participating jurisdictions filed suit in the U.S. District Court for the Eastern District of New York on November 3, 1988, seeking a reversal of that decision. The defendants were the President and Commerce Department and Census Bureau officials, among others. The plaintiffs asserted that a disproportionate undercount of minorities and other disadvantaged groups (and of the states and localities in which the overwhelming majority of members of these groups resided) in the 1990 census was inevitable. They further

²¹² Protection is also afforded by the Trade Secrets Act, 18 U.S. Code § 1905, which imposes criminal penalties on, and removal from office of, federal employees for unauthorized disclosure of confidential business information.

²¹³ U.S. Census Bureau, *1990 Census of Population and Housing History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), Chapter 12. One of these suits, *Lanoue v. Clinton*, had been resolved, but was later refiled as *Slattery v. Clinton* (see below).

²¹⁴ As filed, the title of this action was *City of New York v. U.S. Department of Commerce*. It should be noted that when a lawsuit is filed, the name(s) of the party (or parties) bringing the suit—the plaintiff(s)—appears first in the case name. When a court ruling is appealed to and heard by a higher court, the name of the party filing the appeal (“the appellant”) appears first in the case name, regardless of whether or not the appellant is the plaintiff. The State of Wisconsin intervened in this lawsuit on the side of the defendants and was the first of the defendants to seek Supreme Court review of the circuit court ruling. Additionally, while most of the cases summarized in this section involve multiple plaintiffs and/or multiple defendants, the *et al.* (“and others”) that would follow the first plaintiff/defendant mentioned in the case name has been left off for the sake of convenience.

argued that as evidence of this inevitability, the Census Bureau had committed itself to a program of undercount research and to the implementation of adjustment-related activities²¹⁵ designed to produce corrected census figures which, if they met certain preestablished standards of reliability, would become the official decennial census data. Plaintiffs claimed that the Department of Commerce's decision to overrule the Census Bureau and quell those activities was arbitrary and capricious and in violation of the Administrative Procedure Act (APA). Furthermore, they alleged that the anticipated undercount in the 1990 census would result in a loss of political representation and federal funding to the plaintiff jurisdictions and the individual plaintiffs residing in those jurisdictions, thereby violating those individuals' constitutional rights under Article I, Section 2, and the Fifth and Fourteenth Amendments to the Constitution.

The plaintiffs requested an injunction to preclude the taking of the 1990 census unless it were subject to an adjustment. Specifically, they asked the court to require the defendants to (1) conduct a "full-scale" post-enumeration survey (PES) in connection with the 1990 decennial census; (2) correct the 1990 census for undercounts or overcounts, using the most accurate correction methods available; and (3) use the corrected population figures for all purposes for which the defendants use decennial census data.

In July 1989, the parties agreed to "stay" (postpone) the suit (the "Agreement"). The Agreement provided that the plaintiffs would withdraw their motion to enjoin the taking of the census; in exchange, the department would undertake a thorough reconsideration of the question of adjusting the 1990 census. The Census Bureau agreed not only to conduct the traditional enumeration, but also a PES and certain other adjustment-related planning operations in a manner intended to result in the most accurate counts practicable. The Secretary of Commerce would make an adjustment if, in his judgment, doing so would satisfy guidelines developed by the department. These guidelines, published in final form in March 1990, were to establish the technical and policy grounds upon which the Secretary would base his decision.²¹⁶

Also as part of the Agreement, Commerce Secretary Robert A. Mosbacher convened an eight-member special advisory panel in October 1989 to make individual recommendations to him on whether to adjust the 1990 census. The plaintiffs and defendants each selected four panel members. The decision on adjustment was to be made no later than July 15, 1991.

In June 1991, the eight members of the panel sent the Secretary their individual recommendations on adjustment. They split—the plaintiffs' four in favor and the defendants' four against. The same month, Barbara Everitt Bryant, the Census Bureau's Director, and Michael Darby, Under Secretary of Commerce for Economic Affairs (and Administrator of the Department's Economics and Statistics Administration, which had immediate oversight of the Census Bureau), presented their recommendations to Secretary Mosbacher—Dr. Bryant for adjustment, and Dr. Darby against.²¹⁷

Dr. Bryant cited the majority opinion of the Census Bureau's Undercount Steering Committee²¹⁸ (USC) that the improvement to the counts, on average, for higher levels of geography (the nation, states, and places with a population of 100,000 or more) brought about by statistical adjustment

²¹⁵ At that time, the "adjustment-related activities" embodied dual system estimation. In general, a sample survey would be conducted contemporaneously with the decennial census, and the questionnaires from the households in the survey would be matched against those from the same households in the census. This methodology provided a measure of coverage: (1) persons found in the survey but not in the census reflected an undercount and (2) persons found in the census but not in the survey reflected an overcount. From these results, the Census Bureau would develop mathematical adjustment factors, tailored to the age, gender, race, geographic location, etc., of the persons involved. These adjustment factors would then be applied to the census data to correct for net overcount and undercount.

²¹⁶ *Federal Register*, Vol. 55, No. 51 (March 15, 1990), pp. 9838–61.

²¹⁷ U.S. Census Bureau, Barbara Everitt Bryant, Director, "Recommendation to Secretary of Commerce Robert A. Mosbacher on Whether or Not to Adjust the 1990 Census," June 28, 1991; U.S. Department of Commerce, Michael R. Darby, Under Secretary of Commerce for Economic Affairs, "Recommendation to the Secretary on the Issue of Whether or Not to Adjust the 1990 Decennial Census," undated.

²¹⁸ The USC was a group of senior Census Bureau statisticians and demographers convened to evaluate the agency's adjustment research and results.

would more than outweigh the risk that the adjusted data were possibly less accurate for smaller geographic areas.²¹⁹ She concluded, “I stand . . . with the majority of the Census Bureau’s Undercount Steering Committee in judging that adjustment would improve the 1990 census.”²²⁰

Dr. Darby’s recommendation against adjustment focused on distributive accuracy,²²¹ but also raised concerns that adjustment was “substantially more vulnerable to manipulation for political gain,” would “institutionalize non-participation in the census,” and result in two sets of census numbers being issued. This latter circumstance would “introduce chaos, additional costs and further litigation into the political redistricting process. . . .” He noted the “heavier emphasis” Dr. Bryant placed on the perceived superior numeric accuracy of the adjusted data at broad geographic levels, but stated that distributive accuracy was important for most uses of census data. He stated that “[no] convincing evidence has been presented that they [the adjusted data] will increase . . . distributive accuracy.” He concluded: “Ultimately, it is your decision, Mr. Secretary, as to which criterion [numeric versus distributive accuracy] is more important for all the purposes of the census.”²²²

The Secretary considered the range of issues and the diversity of professional opinion among his advisors concerning adjustment of the 1990 census. He evaluated the adjusted counts in terms of the eight guidelines developed as criteria for the adjustment decision.²²³ On July 15, 1991, Mosbacher announced that the 1990 decennial census would not be statistically adjusted.²²⁴

In deciding against adjustment, Mosbacher acknowledged that adjustment would likely lead to more accurate figures at the national level²²⁵ and for racial and ethnic minorities.²²⁶ There was a division of opinion among the Secretary’s advisors as to whether the adjusted counts would result in greater distributive accuracy at the state and local levels.²²⁷ Mosbacher concluded that use of the adjusted numbers would not result in greater distributive accuracy, the appropriate measurement relating to apportionment of the U.S. House of Representatives.²²⁸ He also expressed concern that uncertainty in the adjustment methodology and its assumptions might lead to disagreement over the numbers²²⁹ and that further research might weaken the evidence supporting adjustment.²³⁰ Mosbacher also felt that “. . . adjustment would open the door to political tampering with the census in the future.”²³¹ However, Secretary Mosbacher requested that the Census Bureau research the possible incorporation of results from the PES in the intercensal estimates program.²³²

Following Mosbacher’s decision, the plaintiffs returned to court, seeking an order compelling the department to adjust the 1990 census to rectify the acknowledged undercount of certain minority groups. The plaintiffs asserted this undercount would result in the injuries claimed in their complaint. They also alleged that the decision violated the July 1989 agreement, the APA, and the Constitution and that it was influenced by partisan political considerations. The States of Wisconsin and Oklahoma joined the suit on the side of the government in September and December of 1991, respectively.

In February 1992, the district court granted the plaintiffs’ request for an evidentiary hearing (that is, a trial). Judge Joseph K. McLaughlin presided over the 13-day trial. Expert witnesses from both sides presented extensive, highly technical testimony on the assumptions, methodology, and

²¹⁹ “Recommendation to Secretary of Commerce Robert A. Mosbacher on Whether or Not to Adjust the 1990 Census,” p. 15.

²²⁰ *Ibid.*, p. 4.

²²¹ Distributive accuracy refers here to the total state counts most accurately reflecting the correct proportionality of one state to another, based upon resident population size.

²²² “Recommendation to the Secretary on the Issue of Whether or Not to Adjust the 1990 Decennial Census,” p. E-2.

²²³ *Federal Register*, Vol. 55, No. 51 (March 15, 1990), pp. 9838–61.

²²⁴ *Federal Register*, Vol. 56, No. 140 (July 22, 1991), pp. 33582–642.

²²⁵ *Ibid.*, p. 33583.

²²⁶ *Ibid.*, p. 33582.

²²⁷ *Ibid.*, p. 33583.

²²⁸ *Ibid.*, p. 33584.

²²⁹ *Ibid.*, p. 33583.

²³⁰ *Ibid.*, p. 33584.

²³¹ *Ibid.*, p. 33583.

²³² *Ibid.*, pp. 33582–83.

results of the Census Bureau's adjustment procedure. On April 13, 1993, while finding much substantive merit in the plaintiffs' case, Judge McLaughlin ruled in favor of the defendants, stating that the Secretary's decision not to adjust the 1990 decennial census counts did not violate the APA, the Constitution, the agreement entered into by the parties, or any statute. He stated that the Secretary's conclusions under each guideline and his ultimate decision against adjustment could not be characterized as "arbitrary or capricious," an APA standard of review. However, he noted that ". . . were this Court called upon to decide this issue *de novo*, I would probably have ordered the adjustment."²³³ Judge McLaughlin also observed in a footnote that ". . . in light of recent improvement in statistical tools and the practical benefits that the 1990 PES has provided, the use of adjustment in the next census is probably inevitable."²³⁴

The plaintiffs filed an appeal in the U.S. Court of Appeals for the Second Circuit in July 1993. They argued that the district court had incorrectly applied an APA standard of review to the case, contending that the appropriate standard was one under the Constitution.

The Second Circuit Court heard oral argument in January 1994 and, in August of the same year, voided the decision of the district court, finding that the lower court had applied the wrong standard of review. The Second Circuit Court agreed with the district court in rejecting a *de novo* standard of review that would have resulted in the circuit court deciding which numbers—the adjusted or unadjusted data—were more accurate. It also rejected conclusions reached by the Sixth and Seventh Circuit Courts of Appeals in the early 1990s, both of which held that there was no judicially recognizable right to sue over adjustment of the census.²³⁵

Holding that "the right to equal apportionment is rooted in the right to equal protection,"²³⁶ the Second Circuit Court determined that the equal protection provisions of the Fifth and Fourteenth Amendments to the Constitution required the application of standards developed under the "one-person, one-vote" cases. This set of standards requires that when a government action affects the fundamental right to vote of a "suspect" class, such as a minority group, the action be subject to "heightened scrutiny." The government must make a good faith effort to achieve equal representation as nearly as practicable. According to the court, the adjusted data were concededly more accurate than the unadjusted census counts. Therefore, because the government chose to use the less accurate counts, causing a disparate and harmful impact upon minorities, if the decision were to stand, the government had to demonstrate that such a position (1) furthered a legitimate governmental objective and (2) was essential for the achievement of that objective.²³⁷ The Second Circuit Court returned the case to the district court for a determination of the presence of a "legitimate governmental objective."

The States of Wisconsin and Oklahoma subsequently filed petitions for rehearing in the Second Circuit, which were rejected. These same parties then filed petitions for writs of *certiorari* ²³⁸ in the Supreme Court on March 31 and April 4, 1995, respectively, followed by the federal government defendants filing their own *certiorari* petition on June 5. On June 30, the States of Indiana and Ohio jointly filed an *amicus curiae* ²³⁹ brief recommending that the Court agree to hear the case. The plaintiffs filed a response brief on July 3, requesting that the Supreme Court deny the petitions. Subsequently, additional *amicus* briefs in support of the *certiorari* petitions were filed, including one by the Commonwealth of Pennsylvania and another by U.S. Senators Herb Kohl (D-WI), Russ Feingold (D-WI), and Arlen Specter (R-PA). The Supreme Court granted the *certiorari* petitions and heard oral argument on January 10, 1996. The court issued its decision on March 20 of that year.

²³³ *City of New York v. U.S. Department of Commerce*, 822 F.Supp. 906, 928 (E.D.N.Y. 1993).

²³⁴ *Ibid.*, p. 928, fn. 27.

²³⁵ The Sixth and Seventh Circuit Courts decided the 1990 census adjustment cases of *City of Detroit v. Franklin* (4 F.3d 1367 (CA6 1993)) and *Tucker v. U.S. Department of Commerce* (958 F.2d 1411 (CA7 1992)), respectively. For summaries of these cases, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), pp. 12-9–12-11.

²³⁶ *City of New York v. U.S. Department of Commerce*, C.A. 2 (N.Y.) 1994, 34 F.3d 1114, 1128.

²³⁷ *Ibid.*, p. 1131.

²³⁸ A petition for a writ of *certiorari* is a request that a higher court decide to hear a case and review the lower court's ruling. The term most commonly refers to such requests made of the U.S. Supreme Court.

²³⁹ Literally meaning "friend of the court," *amicus curiae* briefs are filed by individuals or entities on behalf of one of the parties to the litigation, but also serve to put forth the particular interests of the *amicus* filer in the matter. They are commonly filed in appeals pertaining to matters of broad public interest.

The Supreme Court reversed the Second Circuit ruling, unanimously upholding the constitutionality of Secretary Mosbacher's decision not to adjust the 1990 census.²⁴⁰ The Opinion of the Court, delivered by Justice Rehnquist, stated that Mosbacher's action was ". . . well within the constitutional bounds of discretion over the conduct of the census provided to the Federal government."²⁴¹ Utilizing the standard the Court had established in two earlier constitutional challenges relating to the 1990 census, the adjustment decision was examined to determine if it was ". . . consistent with the constitutional language and the constitutional goal of equal representation."²⁴² Notwithstanding his acknowledgment of the likely superior numeric accuracy (at the national level) of the adjusted counts, the Court determined that the Secretary's decision to focus on distributive accuracy was

. . . not inconsistent with the Constitution. Indeed, a preference for distributive accuracy (even at the expense of some numerical accuracy) would seem to follow from the constitutional purpose of the census, viz., to determine the apportionment of the Representatives among the States.²⁴³

The justices further rejected the plaintiffs' contention that the Court should conduct a *de novo* review of the Secretary's determination that the evidence before him tended to support the greater distributive accuracy of the unadjusted counts, and they noted that Mosbacher's conclusion was a ". . . reasonable choice in an area where technical experts disagree."²⁴⁴ The Court therefore concluded that, given the virtually unlimited discretion in conducting the census vested in Congress by the Constitution and the delegation of that broad authority by Congress to the Secretary of Commerce, the Secretary's decision not to adjust the 1990 census counts was ". . . consonant with . . . the text and history of the Constitution. . . ."²⁴⁵

The ruling acknowledged that the Secretary of Commerce enjoys a substantial degree of discretion in the methods used to take the census. However, the decision did not address either the constitutionality or the legality of sampling: "We do not decide whether the Constitution might prohibit Congress from conducting the type of statistical adjustment considered here"²⁴⁶ [nor] ". . . the precise bounds of the authority delegated to the Secretary through the Census Act."²⁴⁷

National Law Center on Homelessness and Poverty v. Kantor. In this suit, filed in the U.S. District Court for the District of Columbia on October 8, 1992, the plaintiffs challenged the design, implementation, and results of the 1990 decennial census Shelter and Street Night (S-Night) operation.²⁴⁸ The plaintiffs claimed that the 1990 count of people living in shelters or present at pre-identified street sites was ". . . so arbitrarily limited in scope and deficient in execution as to be useless as a count of even a segment of the homeless population."²⁴⁹

Plaintiffs included the cities of Baltimore and San Francisco, shelters and service providers, advocacy organizations, and homeless persons and registered voters from the named jurisdictions. The defendants in the case were the Census Bureau, the Department of Commerce, and the Secretary of Commerce.

²⁴⁰ *Wisconsin v. City of New York*, 517 U.S. 1 (1996).

²⁴¹ *Ibid.*, p. 24.

²⁴² *Ibid.*, p. 19. In *Department of Commerce v. Montana* (503 U.S. 442 (1992)), the Court upheld the use of the equal proportions apportionment formula. In *Franklin v. Massachusetts* (505 U.S. 788 (1992)), the Court upheld the inclusion in the apportionment counts of overseas military and federal civilian personnel and their dependents living with them. For summaries of these cases, see U.S. Census Bureau, *1990 Census of Population and Housing History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), pp. 12-14-12-16.

²⁴³ *Ibid.*, p. 20.

²⁴⁴ *Ibid.*, p. 23.

²⁴⁵ *Ibid.*, p. 24, citing *Franklin*, 505 U.S., at 806.

²⁴⁶ *Ibid.*, p. 19, fn. 9.

²⁴⁷ *Ibid.*, p. 19, fn. 11.

²⁴⁸ *National Law Center on Homelessness and Poverty v. Brown*, Civ. A. No. 92-2257, U.S.D.C. for the District of Columbia, Complaint for Declaratory and Injunctive Relief. Shelter and Street Night was a census operation that took place during the evening hours of March 20 and the early morning hours of March 21, 1990. It was designed to count persons living in pre-identified public shelters (including those for abused women) and places of commerce such as bus or train stations, and persons visible on the streets. For a more detailed description of the operation, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part A* 1990 CPH-R-2A (Washington, DC: Government Printing Office, 1993), pp. 6-52-6-53.

²⁴⁹ Complaint for Declaratory and Injunctive Relief, p. 5.

Advocacy organization plaintiffs argued they were injured by S-Night results and the Census Bureau's inadequate disclaimer regarding the comprehensiveness of the data²⁵⁰ because they needed to expend considerable resources to counter "misinformation" resulting from the release of S-Night counts,²⁵¹ which they claimed substantially understated the "true" homeless population.²⁵²

Plaintiffs who were recipients (both direct and indirect) of federal funds—municipalities, shelters and service providers, and individual homeless persons—contended they lost or would lose federal monies from programs that utilize census data in allocating funds as a result of the deficient S-Night counts.²⁵³

Individual registered voters who were parties to the suit claimed that the undercount of the homeless population would result in dilution of their vote, in violation of the constitutional requirement of equal representation.²⁵⁴

Finally, plaintiffs contended that defendants' actions violated the Constitution, the APA, and other laws affecting the homeless.²⁵⁵

The plaintiffs requested that the court require the defendants to (among other things):

- (1) Include a disclaimer as to the accuracy of S-Night figures on all releases of the data and provide such notice to the highest-elected official of each state and local government in the United States and to the heads of relevant federal agencies.
- (2) Recount the homeless population using such techniques as sampling and estimation and incorporate the results of this recount into the 1990 census counts.
- (3) Use the results of such count for all relevant funding allocations.
- (4) Employ similar statistical techniques to count the homeless in the 2000 decennial census.²⁵⁶

The district court heard oral argument in July 1993 and issued its ruling on September 15, 1994, in which it dismissed the suit.²⁵⁷

Citing the *Franklin* case, the court ruled that the appropriate standard of review in census cases was not the APA standard, but a constitutional one.²⁵⁸ It found that the Census Bureau's

. . . alleged failure to count the homeless is not tantamount to a failure to perform their constitutional duty to conduct the decennial census. The Constitution does not provide individuals with a right to be counted. . . . Nor did defendants discriminate against the homeless in violation of the Equal Protection Clause. Homeless persons are not a suspect class. . . . Accordingly, plaintiffs must show intentional discrimination by the Census Bureau in order to make out an equal protection claim. . . . [T]he undisputed facts about S-Night's development and application of special methods for counting the homeless preclude a constitutional claim of intentional neglect.²⁵⁹

The plaintiffs appealed this decision to the U.S. Court of Appeals for the District of Columbia Circuit in October 1994. That court heard oral argument in October 1995 and issued its decision on August 9, 1996.

²⁵⁰ *Ibid.*, at ¶¶ 98–100.

²⁵¹ *Ibid.*, at ¶ 44.

²⁵² *Ibid.*, at ¶¶ 62–65.

²⁵³ *Ibid.*, at ¶¶ 42 and 43.

²⁵⁴ *Ibid.*, at ¶ 46.

²⁵⁵ These other laws include 13 U.S.C. § 141 and 2 U.S.C. § 2a. *Ibid.*, pp. 5–6.

²⁵⁶ *Ibid.*, pp. 35–36.

²⁵⁷ *National Law Center on Homelessness and Poverty v. Brown*, Civ. A. No. 92-2257, 1994 WL 521334 (D.D.C. Sept. 15, 1994). This case was not selected for publication in the *Federal Supplement*.

²⁵⁸ *Ibid.*, at *7, citing *Franklin v. Massachusetts* (112 S.Ct., at 2777 (1992)).

²⁵⁹ *Ibid.*, at *8.

The U.S. Court of Appeals for the District of Columbia Circuit affirmed the district court's ruling in favor of the defendants, although on different grounds.²⁶⁰ It noted that the lower court did not address the issue of standing,²⁶¹ but instead made its ruling on the merits of plaintiffs' claims. The Court of Appeals determined that it was first appropriate to decide whether plaintiffs—any of them—had standing to bring their suit, before addressing the substance of their complaint. However, because the Court of Appeals in fact determined that plaintiffs *did not* have standing, as discussed below, it did not need to address the merits of the case.

The court determined that none of the plaintiffs could demonstrate suffering a concrete injury and none was likely to suffer injury as a result of defendants' actions in the conduct of S-Night. For example, the court noted that plaintiff advocacy organization the National Law Center on Homelessness and Poverty (NLC) had expended resources to collect and disseminate data and information on the homeless population before and after the conduct of S-Night, and these appeared to be ordinary program expenditures for the organization, so the NLC would have expended resources on these activities regardless of the particular conduct and results of S-Night. Thus, the court concluded, it cannot be said that the NLC was injured by defendants' actions.²⁶²

With regard to plaintiff recipients of federal funds, the court stated that one cannot specifically determine the effect a given methodology for counting the homeless would have on the federal funding of a particular plaintiff recipient. In fact, an improved count's effect on any recipient depends both on the use to which census data are put in a given program and on the methodology's effect on the counts of other recipients. Given that in most federal programs the disbursement of funds is based on a fixed sum, the court reasoned a more accurate recount might enlarge some communities' shares, but at the same time, reduce the shares of other communities (including possibly, the plaintiff municipalities). This situation would occur because even though the latter communities' counts would be larger than before, they would show smaller proportional increases than the counts of localities whose funding shares would increase.²⁶³

Additionally, the court found that none of the plaintiffs demonstrated that the Census Bureau's implementation of its S-Night procedures *caused* the alleged injuries nor was any plaintiff able to establish that the use of proffered alternative methodologies likely would result in significantly different outcomes.²⁶⁴ For example, with regard to the vote dilution claim of the individual plaintiffs, the court determined that the plaintiffs could not demonstrate that a different counting method would not only have resulted in greater numbers of homeless being counted, but would have relieved the dilution of their votes.²⁶⁵ Therefore, the court determined that plaintiffs also had failed to meet the causation and redressability requirements of standing.

The plaintiffs did not appeal the Court of Appeals ruling.

Slattery v. Clinton (originally filed as Lanoue v. Clinton). This suit, in its original incarnation, was filed by Spencer Roff Lanoue and other plaintiffs in the U.S. District Court for the District of Connecticut on March 31, 1993. The plaintiffs were parents and their children who were conceived but not born prior to April 1, 1990 (Census Day).

The plaintiffs claimed that the Census Bureau's deliberate exclusion from the 1990 census counts of children born within 9 months after April 1, 1990, undermined the right of the adult plaintiffs to their fair share of representation in the U.S. House of Representatives, in violation of the Census Clause (Article I, Section 2, Clause 3) of the Constitution as amended by Section 2 of the

²⁶⁰ *National Law Center on Homelessness and Poverty v. Kantor*, No. 94-5312, 1996 WL 446791 (D.C.Cir., 1996).

²⁶¹ Defined briefly, "standing to sue" is a concept used to determine if the plaintiff is sufficiently affected by the action at issue so that the claim can be adjudicated by a court. To establish standing, plaintiffs must demonstrate that (1) they have suffered an injury, (2) the injury was caused by the defendant, and (3) the injury is redressable by the court. *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 561, 112 S.Ct. 2130, 119 L.Ed.2d 351 (1992); *Allen v. Wright*, 468 U.S. 737, 751, 104 S.Ct. 3315, 82 L.Ed.2d 556 (1984).

²⁶² *National Law Center on Homelessness and Poverty v. Kantor*, No. 94-5312, 1996 WL 446791, at *5.

²⁶³ *Ibid.*, at **6–8.

²⁶⁴ *Ibid.*, at **5–6.

²⁶⁵ *Ibid.*, at **8–9.

Fourteenth Amendment to the Constitution. Plaintiffs sought to have the 1990 census counts “corrected” to include these individuals.²⁶⁶ The defendants were Bill Clinton, President of the United States; William M. Daley, Secretary of the Department of Commerce; and the Director of the Census Bureau.

For procedural reasons, the suit was initially dismissed “without prejudice”—meaning that plaintiffs would be permitted to refile their suit—and on April 1, 1996, with the Lanoue child and parents no longer party to the suit and the addition of new plaintiffs John, Christopher, and Eileen Slattery of New York, the suit was recommenced in the U.S. District Court for the Southern District of New York. Plaintiffs’ claims remained the same, and on March 28, 1997, the district court granted defendants’ motion to dismiss. The court ruled that plaintiffs had failed to establish standing, because they did not provide evidence that counting unborn fetuses would have produced a different (and more favorable) apportionment of representatives.²⁶⁷ The court went on to note that even if plaintiffs were provided an opportunity to amend their complaint to provide such evidence, their claims would fail on the merits.

Thus, the court rejected plaintiffs’ claim that the term “persons” as it is used in the Census Clause and Section 2 of the Fourteenth Amendment includes fetuses. Rather, the court cited the decision in *Roe v. Wade*,²⁶⁸ in which the Supreme Court held that the word “person” as it is used in Section 1 of the Fourteenth Amendment does not include the unborn. The court noted that it was appropriate to interpret the word “person” (or “persons”) in the Apportionment Clauses in the same manner in which it is interpreted with regard to Section 1 of the Fourteenth Amendment. Thus, the district court rejected plaintiffs’ constitutional claim, noting that there was no constitutional requirement to attempt to include fetuses in the census apportionment counts.²⁶⁹

Plaintiffs appealed the district court ruling to the U.S. Court of Appeals for the Second Circuit. However, on June 16, 1997, the Second Circuit Court dismissed the appeal because plaintiffs failed to meet the filing requirements after filing their notice of appeal.

Census 2000 Litigation

For summary information about the Census 2000 lawsuits, see Table 11-6 at the end of this section.

Clinton v. Glavin and Department of Commerce v. U.S. House of Representatives. These two lawsuits, challenging the legality and constitutionality of the planned uses of sampling to produce the apportionment counts in Census 2000,²⁷⁰ were filed in February 1998.

Glavin v. Clinton (as filed) was filed in the U.S. District Court for the Eastern District of Virginia, Alexandria Division, on February 12 by Matthew Glavin (then-president of the Atlanta-based Southeastern Legal Foundation); Robert Barr, individually and in his capacity as a member of the U.S. House of Representatives (R-GA); William J. Byrn, individually and in his official capacity as Cobb County (GA) Commission Chairman; Cobb County, Georgia; Bucks County, Pennsylvania; Delaware County, Pennsylvania; DuPage County, Illinois; and residents of Georgia, Indiana, Pennsylvania, Ohio, Virginia, Florida, Connecticut, California, Nevada, Arizona, New Jersey, Montana, Wisconsin, and Illinois.

²⁶⁶ U.S. Census Bureau, *1990 Census of Population and Housing, History, Part A*, 1990 CPH-R-2A (Washington, DC: Government Printing Office, 1993), pp. 12-18 and 12B-4; and summary of case history in *Slattery v. Clinton*, No. 96 Civ. 2366 DLC, 1997 WL 148235, at *1 (S.D.N.Y. March 28, 1997). This case was not selected for publication in the *Federal Supplement*. Section 2 of the Fourteenth Amendment to the Constitution reads, in part: “Representatives shall be apportioned among the several States according to their respective numbers, counting the whole number of persons in each State. . . .”

²⁶⁷ *Slattery v. Clinton*, No. 96 Civ. 2366 DLC, 1997 WL 148235, at *2. In her decision, the district court judge raised the practical difficulty of knowing, as of Census Day, which fetuses would result in live births. *Ibid.* at *1, fn. 2.

²⁶⁸ 410 U.S. 113 (1973).

²⁶⁹ *Slattery v. Clinton*, No. 96 Civ. 2366 DLC, 1997 WL 148235, at *3.

²⁷⁰ *Glavin* plaintiffs also contended that the Census Bureau’s planned use of sampling in the census would result in their loss of political representation at the intrastate level (as a result of the issuance of statistically adjusted redistricting data) and of federal funding. *Glavin v. Clinton*, Civ. A. No. 98-207-A, U.S.D.C. for the Eastern District of Virginia, Alexandria Division, Complaint for Declaratory and Injunctive Relief, ¶¶ 60-61 and ¶ 67.

The defendants were William J. Clinton, President of the United States; the U.S. Department of Commerce; William M. Daley, Secretary of the Department of Commerce; the U.S. Bureau of the Census; and James F. Holmes, Acting Director of the Bureau of the Census.

Numerous individuals and entities intervened in the case on behalf of the defendants. Additionally, a number of *amicus curiae* briefs were filed—some on behalf of the defendants, others on behalf of the plaintiffs.

U.S. House of Representatives v. Department of Commerce (as filed) was brought by the U.S. House leadership on behalf of the U.S. House of Representatives and filed on February 20 in the U.S. District Court for the District of Columbia. Defendants included the U.S. Department of Commerce; William M. Daley, Secretary of the Department of Commerce; the U.S. Bureau of the Census; and James F. Holmes, Acting Director of the Bureau of the Census.

Parties that intervened on behalf of the defendants in the *Glavin* suit intervened or sought to intervene on defendants' behalf in this case, and a number of *amicus* briefs were also filed in this case. In both cases, plaintiffs sought a declaration that the proposed uses of sampling violated the Census Act and the Census Clause of the Constitution and sought an injunction barring their use in Census 2000 for apportionment purposes.

In the *U.S. House of Representatives* case, the court issued its decision and order on August 24, 1998. With regard to the issue of the plaintiff's standing to bring the suit, the three-judge district court ruled that the House had “. . . properly alleged a judicially cognizable injury through [1] its right to receive information by statute and through [2] the institutional interest in its lawful composition. . . .”²⁷¹ On the merits, the court ruled that Section 195 of Title 13 prohibited the use of sampling to produce the apportionment counts and permanently enjoined the Census Bureau from implementing its planned uses of statistical sampling to produce the apportionment counts in Census 2000. Defendants appealed the district court ruling to the U.S. Supreme Court, and the Court noted probable jurisdiction on September 10, 1998.

On September 24, the district court panel in the *Glavin* case also ruled that Section 195 barred the use of sampling (both proposed uses) in the production of the apportionment counts and permanently enjoined its use. The executive branch appealed the district court ruling to the Supreme Court of the United States, and on October 9, the Court noted probable jurisdiction. The Supreme Court agreed to hear the cases²⁷² and consolidated them for oral argument, which took place on November 30, 1998. A number of *amicus* briefs were filed in the Supreme Court—some on behalf of the appellees and others on behalf of the appellants.

On January 25, 1999, the Supreme Court ruled, in *Department of Commerce v. U.S. House of Representatives*, that Section 195 of the Census Act²⁷³ precludes the use of sampling to produce the congressional apportionment counts.²⁷⁴

Justice O'Connor delivered the five-justice majority opinion. Justice Scalia wrote a concurring opinion; Justice Breyer filed a dissenting opinion; and Justice Stevens filed a dissenting opinion, joined in by Justices Souter and Ginsburg.

The Supreme Court ruled that *Glavin* plaintiffs had established standing with regard to their claims of interstate and intrastate vote dilution (claims under Article I, Section 2 and Section 2 of the Fourteenth Amendment to the Constitution). With their motion for summary judgment submitted in district court, plaintiffs had filed an affidavit by Dr. Ronald F. Weber ²⁷⁵ that claimed that “[i]t is a virtual certainty that Indiana will lose a seat . . . under the Department's Plan [to use sampling in the Integrated Coverage Measurement (ICM) program].”²⁷⁶ The Supreme Court contended that,

²⁷¹ *U.S. House of Representatives v. Department of Commerce*, 11 F.Supp.2d 76, 85 (D.D.C. Aug. 24, 1998).

²⁷² *Clinton v. Glavin* (No. 98-564) and *Department of Commerce v. U.S. House of Representatives* (No. 98-404).

²⁷³ Title 13, U.S. Code, the Census Act, provides the statutory authority for the Census Bureau's conduct of censuses and surveys, including the decennial census.

²⁷⁴ *Department of Commerce v. U.S. House of Representatives* (525 U.S. 316, 119 S.Ct. 765 (1999)).

²⁷⁵ A professor of government at the University of Wisconsin–Milwaukee.

²⁷⁶ Affidavit of Dr. Ronald F. Weber, in No. 98-564, at 65.

while citing flaws in Dr. Weber's statistical analysis, the defendants' experts did not refute his ultimate conclusion regarding the State of Indiana's apportionment. Indiana residents' votes would therefore be diluted vis-a-vis residents of other states—demonstration of a concrete harm to and thereby establishing standing for plaintiff Hofmeister, a resident of Indiana.

Additionally, the Court ruled that *Glavin* plaintiffs living in particular counties established that they were substantially likely to suffer (intrastate) vote dilution vis-a-vis residents of other parts of those states with larger net undercount rates, noting that several of these states require the use of decennial census population counts to carry out state legislative redistricting. Plaintiffs' contention of intrastate vote dilution was based on an analysis contained in the Weber affidavit, and the Court concluded that appellants (executive branch entities and officials) were not able to satisfactorily refute his conclusion that the Census Bureau's implementation of the ICM would cause a loss in population share for counties in which plaintiffs reside, thereby resulting in the dilution of their votes. The justices agreed with plaintiffs' contention that these harms could be traced directly to the proposed use of sampling and that enjoining its use would relieve them of the likely injuries.

In addressing the substantive issue of the two cases, the Court examined the provisions of the Census Act in question, Sections 141 and 195. Section 141(a) requires the Secretary of Commerce to conduct a “. . . decennial census of population . . . in such form and content as he may determine, including the use of sampling procedures and special surveys.” Section 195 reads as follows:

Except for the determination of population for purposes of apportionment of Representatives in Congress among the several States, the Secretary shall, if he considers it feasible, authorize the use of the statistical method known as ‘sampling’ in carrying out the provisions of this title.

When Congress amended Title 13 in 1976, one of the revisions involved Section 195. The phrase “the Secretary may, where he deems it appropriate” was changed to “the Secretary shall, if he considers it feasible.” The Clinton administration interpreted the revised except/shall language to mean that Congress made (through the 1976 amendments) sampling permissible for apportionment purposes, but obligatory (*shall*) for all other purposes (upon a determination of feasibility). The Court did not accept that interpretation, noting that for over 200 years federal statutes clearly prohibited the use of sampling to produce the apportionment counts. The Opinion of the Court noted that the Solicitor General (representing the executive branch) argued before the Supreme Court in *Klutznick v. Young*²⁷⁷ that “. . . 13 U.S.C. 195 prohibits the use of statistical ‘sampling methods’ in determining the state-by-state population totals.”²⁷⁸ The Court further noted that the executive branch did not change its position on this interpretation until 1994, when the Clinton administration Assistant Attorney General, in a memorandum to the Solicitor General, concluded that using statistical sampling to adjust census figures was consistent with the Census Act.

The Opinion of the Court concluded that if Congress had intended to permit such a dramatic change (with the 1976 amendment) to the way in which the apportionment counts were produced, it would have been abundantly clear in both the plain text and the legislative history. Thus, the Court ruled, when Congress amended Section 195 of Title 13 in 1976,

²⁷⁷ A 1980 census lawsuit dealing with the issue of statistical adjustment. *Young v. Klutznick*, 652 F.2d 617 (CA6 1981). The 1980 census adjustment litigation is briefly discussed in U.S. Census Bureau, *1980 Census of Population and Housing, History, Part E, PHC80-R-2E* (Washington, DC: Government Printing Office, 1989), p. 10-8.

²⁷⁸ *Department of Commerce v. U.S. House of Representatives*, 525 U.S. 340. In fact, as recently as 1990, the executive branch argued in *City of New York* (the 1990 census adjustment lawsuit discussed earlier) that the use of sampling for apportionment purposes was not permitted by Title 13, U.S. Code, Section 195: “Notwithstanding plaintiffs’ disingenuous claim that no court has ever held that a ‘correction’ of the enumeration is illegal or unconstitutional, . . . the decision in *Orr v. Baldrige* . . . would bar the ‘correction’ [that is, statistical adjustment based on sampling] plaintiffs seek because it held that apportionment counts cannot be derived from sampling.” *City of New York v. U.S. Department of Commerce*, 88-Civ-3474 (JMCL), U.S.D.C. for the Eastern District of New York, Defendants’ Opposition to Plaintiffs’ Motion for a Supplemental Order to Enforce the Court’s July 17, 1989, Order and for Declaratory Judgment, May 3, 1990, p. 11, fn. 7.

[it] . . . changed a provision that permitted the use of sampling for purposes other than apportionment into one that required that sampling be used for such purposes if ‘feasible.’ They also added to the existing delegation of authority to the Secretary to carry out the decennial census a statement indicating that despite the move to mandatory use of sampling in collecting non-apportionment information, the Secretary retained substantial authority to determine the manner in which the decennial census is conducted.²⁷⁹

The majority also rejected the interpretation of Section 195 in Justice Breyer’s opinion. He contended that sampling was permitted so long as it was not used as a substitute for traditional census-taking methods; that is, it was permissible so long as it was utilized only as a “supplement” to the traditional methods. The Court found this interpretation unpersuasive, arguing that even if it were only used to supplement the count, one would still be using sampling “for the determination of population for purposes of apportionment” [the language in Section 195].

Justice Breyer had argued that “Integrated Coverage Measurement would not substitute for, but rather would supplement, a traditional headcount, and it would do so to achieve the basic purpose of the statutes that authorize the headcount—namely, accuracy.”²⁸⁰ He conceded that the nonresponse follow-up operation would use sampling to complete the initial “count,” but contended that because the number of people so estimated was “. . . sufficiently small, as a portion of the total population,”²⁸¹ this use of sampling could still be considered a “supplement” to the enumeration as well.

The Opinion of the Court also noted that the legislative history does not support appellants’ interpretation of Section 195. Had the legislators intended such an interpretation of the language, the Court argued, it is hard to imagine no legislator speaking out on what would amount to a fundamental change to the way the census is taken. Yet the debate during consideration of the 1976 amendments, according to the Opinion of the Court, revealed no such discussions, because such a fundamental change was not intended.

The Court did not address the constitutionality of sampling, having determined sampling’s use for purposes of apportionment violated Section 195. However, in Part II of his concurring opinion—in which Justices Thomas, Rehnquist, and Kennedy joined—Justice Scalia questioned the constitutionality of the use of sampling for apportionment purposes:

For reasons of text and tradition, fully compatible with a constitutional purpose that is entirely sensible, a strong case can be made that an apportionment census conducted with the use of “sampling techniques” is not the “actual Enumeration” that the Constitution requires.²⁸²

He also noted that the executive branch itself had made that argument in *Young v. Klutznick*.²⁸³

Justice Stevens, in his dissenting opinion (in which he adopted appellants’ position on the interpretation of Title 13, U.S. Code, Section 195), also weighed in on the constitutional issue, but came to the opposite conclusion as Justice Scalia. Justice Stevens contended that “[t]he words ‘actual Enumeration’ require . . . apportionments to be based on actual population counts, rather than mere speculation or bare estimate, but they do not purport to limit the authority of Congress to direct the ‘Manner’ in which such counts should be made.”²⁸⁴ He noted “[t]he census is intended to serve ‘the constitutional goal of equal representation.’ That goal is best served by the use of a ‘Manner’ that is most likely to be complete and accurate.”²⁸⁵ Thus, he argued, because “. . . it is perfectly clear that the use of sampling will make the census more accurate . . .,”²⁸⁶ its use for apportionment purposes would pass constitutional muster.

²⁷⁹ *Department of Commerce v. U.S. House of Representatives*, 525 U.S. 341.

²⁸⁰ *Ibid.*, Opinion of Justice Breyer, p. 353.

²⁸¹ *Ibid.*, p. 356.

²⁸² *Ibid.*, Opinion of Justice Scalia, p. 349.

²⁸³ *Ibid.* *Young v. Klutznick*, 497 F.Supp. 1318, 1332 (E.D.Mich. 1980), *rev’d*, 652 F.2d 617 (CA6 1981).

²⁸⁴ *Ibid.*, Opinion of Justice Stevens, p. 363.

²⁸⁵ *Ibid.*, p. 364.

²⁸⁶ *Ibid.*

Finally, because the Court's sustaining of the lower court's ruling in *Glavin* addressed the substantive issue in *U.S. House of Representatives*, the justices determined that there was no need to rule separately on the latter case, and thus dismissed it (although the Supreme Court case retains the name *Department of Commerce v. U.S. House of Representatives*).

Utah v. Evans (Evans I).²⁸⁷ On January 10, 2001, the State of Utah and other plaintiffs, including Utah elected officials and four residents of Utah serving overseas as Mormon missionaries at the time of Census 2000, filed suit in federal district court, claiming that the “. . . Defendants' failure, in the most recent census, to count missionaries of the Church of Jesus Christ of Latter-day Saints ('the LDS Church') who are temporarily serving abroad on the same terms as federal employees temporarily serving abroad”²⁸⁸ would cause the state to be denied a fourth seat in the U.S. House of Representatives. A three-judge panel was convened pursuant to Title 28, U.S. Code, Section 2284.²⁸⁹

In Census 2000, as in the 1990 census, the apportionment numbers included counts of overseas military and federal civilian personnel and their dependents living with them. The overseas households were allocated to particular states based on “home of record” data in their personnel records.

Defendants in the suit included Norman Y. Mineta, Secretary of Commerce, and Kenneth Prewitt, Director, U.S. Census Bureau.

According to the complaint, approximately 10,000 LDS missionaries were serving abroad at the time of Census 2000, and a “. . . correspondingly large proportion of . . . [them] reside in Utah and return there after completing their service.”²⁹⁰ Had these persons been included in the apportionment counts, plaintiffs contended, Utah would receive a fourth House seat. Instead, that seat was slated to be awarded to North Carolina. Plaintiffs also contended that had the overseas federally affiliated households not been included in the apportionment numbers, Utah would receive a fourth seat.

Among other things, plaintiffs sought an order directing the defendants to include in the Census 2000 apportionment counts those missionaries of the LDS Church who were temporarily serving abroad at the time of the census. Alternatively, plaintiffs requested that the U.S. District Court for the District of Utah, Central Division, issue an injunction requiring defendants to remove counts of the overseas federally affiliated persons from the apportionment figures.²⁹¹ Plaintiffs also sought a declaration that in failing to include in the apportionment counts LDS missionaries serving abroad, the “. . . Census Bureau's disparate treatment of similarly-situated citizens”²⁹² was unconstitutional under the Apportionment Clause, Equal Protection and Due Process Clauses, and Section 2 of the Fourteenth Amendment; arbitrary and capricious under the Administrative Procedure Act (APA); and in violation of Title 2, U.S. Code, Section 2a, the Religious Freedom Restoration Act (RFRA), and the Census Act.

With regard to their claim under the RFRA, plaintiffs contended that “[d]efendants' disparate treatment of U.S. citizens temporarily living abroad substantially burdens the free exercise of the LDS faith” and “. . . frustrates, rather than furthers, the compelling governmental interests associated with the census,”²⁹³ thereby resulting in a violation of the act.

Given the State of North Carolina's interest in the matter—if Utah prevailed, the 435th seat would be assigned to Utah instead of North Carolina—that state, its governor, lieutenant governor, attorney general, the majority and minority leaders of the two houses of the North Carolina legislature,

²⁸⁷ Because the State of Utah and other plaintiffs in this suit later filed a second suit against the Secretary of Commerce (Donald Evans) and Census Bureau Director, this suit is sometimes referred to as *Evans I*.

²⁸⁸ *Utah v. Evans*, No. 2:01CV0023B, in the U.S.D.C. for the District of Utah, Central Division, Plaintiffs' First Amended Complaint for Declaratory and Injunctive Relief, p. 2.

²⁸⁹ *Utah v. Evans*, 143 F.Supp.2d 1290, 1293 (D.Utah April 17, 2001).

²⁹⁰ Plaintiffs' First Amended Complaint at ¶ 39.

²⁹¹ *Ibid.*, at ¶ 3.

²⁹² *Ibid.*, at ¶ 8.

²⁹³ *Ibid.*, at ¶ 72.

and the state's entire congressional delegation filed a motion to intervene in the suit on the side of defendants; the court granted the motion.²⁹⁴

On April 13, 2001, plaintiffs filed a Motion for Leave to File a Third Amended Complaint. Through a third amended complaint, plaintiffs sought to add a claim alleging that had the Census Bureau not employed the use of "hot-deck" count imputation in producing the Census 2000 apportionment counts, Utah would have received one additional seat for a total of four seats in the U.S. House of Representatives. On April 17, the three-judge panel of the district court denied plaintiffs' motion,²⁹⁵ and the plaintiffs later filed the imputation claim as a separate lawsuit. That case, also styled as *Utah v. Evans (Evans II)*, is discussed below.

Also on April 17, the district court issued its opinion granting defendants' and intervenors' cross-motions for summary judgment and denying plaintiffs' motion for summary judgment.²⁹⁶

With regard to their RFRA claim, the court held that the plaintiffs (the four Utah residents who were on overseas LDS missions at the time of Census 2000)

" . . . present[ed] nothing more than conclusory and completely speculative allegations that their practice of religion or religious beliefs were burdened in any way by the Census Bureau's decision not to enumerate LDS missionaries who were abroad on Census Day 2000."²⁹⁷

Additionally, the court determined that the Census Bureau's inclusion of federally affiliated households in the apportionment counts, but not other groups of Americans overseas, did not violate the Census Act.

The court further held that the ruling in *Franklin v. Massachusetts* (505 U.S. 788 (1992)) foreclosed the possibility of a claim under the APA.²⁹⁸ In that case, plaintiffs challenged, among other things, the Census Bureau's inclusion of overseas federally affiliated households in the 1990 census apportionment counts, which the Supreme Court upheld.²⁹⁹ With regard to the APA, the Supreme Court held that the Secretary of Commerce's transmittal of state population totals to the President of the United States was not a final agency action reviewable under the APA, because the apportionment counts were not final until the President took affirmative steps to calculate and transmit the apportionment to Congress.³⁰⁰ Furthermore, the Court noted that the President's action was not subject to review under the APA, because that office is not an agency within the meaning of the act.

Finally, the district court examined plaintiffs' claims under the Constitution. The court noted that if it were to direct the Census Bureau to include LDS missionaries abroad in the Census 2000 apportionment counts, such action would clearly favor Utah vis-a-vis all other states. It went on to further note that *Franklin* established that ". . . the 'constitutional goal' underlying the Apportionment Clause is 'equal representation'."³⁰¹ The court therefore concluded "[g]iven that the goal of apportionment is 'to achieve a fair apportionment for the *entire country* [emphasis added],' . . . commanding the enumeration of one group from one state obviously fails to further the constitutional goal of 'equal representation.' Indeed, inclusion of one such group to the clear advantage of one state would seem to undermine another goal of the Apportionment Clause, which is distributive accuracy."³⁰²

The court also noted that if it were to order the defendants to include LDS missionaries in the apportionment counts, there would likely be similar constitutional challenges brought by other groups of Americans overseas (business people, students, members of other religious institutions,

²⁹⁴ *Utah v. Evans*, 143 F.Supp.2d 1290.

²⁹⁵ *Utah v. Evans*, No. 2:01CV0023B, in the U.S.D.C. for the District of Utah, Central Division, Order of April 17, 2001.

²⁹⁶ *Utah v. Evans*, 143 F.Supp.2d 1290, 1293.

²⁹⁷ *Ibid.*, p. 1297.

²⁹⁸ *Ibid.*, p. 1295.

²⁹⁹ For a summary of the *Franklin* case, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), pp. 12-14-12-16.

³⁰⁰ *Franklin*, 505 U.S. 799.

³⁰¹ *Utah v. Evans*, 143 F.Supp.2d 1298, citing *Franklin*, 505 U.S. 806.

³⁰² *Ibid.*, citing *U.S. Department of Commerce v. Montana*, 503 U.S. 442, 464 (1992).

etc.). Moreover, the court opined, “. . . the inclusion of various other groups of private American citizens abroad . . . [would] invite the kind of manipulation by states or the injection of local or parochial bias which the founders wished to avoid.”³⁰³

With regard to plaintiffs’ alternative requested remedy—that the defendants be required to remove counts of the overseas federally affiliated persons from the apportionment totals—the court relied on the *Franklin* case in which the Supreme Court found that the Secretary’s decision to include these persons in the apportionment counts was

. . . consonant with, though not dictated by, the text and history of the Constitution. . . . The Secretary’s judgment does not hamper the underlying constitutional goal of equal representation, but, assuming that employees temporarily stationed abroad have indeed retained their ties to their home States, actually promotes equality.³⁰⁴

The court noted that the *Franklin* ruling discussed how the federally affiliated households were a unique group of overseas Americans. With regard to methodological concerns, they had retained their ties to particular states and could be reliably counted. Also, there was bipartisan support in Congress for their inclusion in the 1990 census apportionment counts. Furthermore, their overseas posting was involuntary, that is, at the behest of their government, which differentiated them from most other groups of Americans overseas. In addition, the district court noted that the

. . . evidence presented in this case indicates that, while the distribution of federal overseas employees among the fifty states does not precisely mirror the distribution of resident state populations, it also does not present any extreme variations among the states.³⁰⁵

Thus, the court concluded in its April 17, 2001, ruling that the Secretary’s decision to only include federally affiliated overseas Americans in the Census 2000 apportionment counts was “. . . a rational exercise of the Secretary’s discretion, delegated to the Census Bureau, to conduct its obligation to enumerate the population for apportionment purposes.”³⁰⁶

Plaintiffs subsequently filed a petition for writ of *certiorari* in the U.S. Supreme Court.³⁰⁷ On November 26, 2001, the Court issued a summary affirmation (without hearing the case) of the April 17, 2001, judgment of the three-judge panel of the district court.³⁰⁸

Utah v. Evans (Evans II). On April 25, 2001, the State of Utah and other plaintiffs, including Utah elected officials and four residents of the state, filed a second lawsuit (discussion of the first one immediately precedes this summary) relating to Census 2000, this one contending that the state lost a seat in the U.S. House of Representatives as a result of the Census Bureau’s use of “hot-deck” count imputation in producing the apportionment counts.³⁰⁹ Plaintiffs argued that had count imputation not been used, Utah, rather than the state of North Carolina, would have been awarded the 435th House seat.³¹⁰

³⁰³ *Ibid.*, p. 1301.

³⁰⁴ *Ibid.*, p. 1299, citing *Franklin*, 505 U.S. 806.

³⁰⁵ *Ibid.*, p. 1301.

³⁰⁶ *Ibid.*

³⁰⁷ In apportionment cases, the Supreme Court serves as the immediate appellate court for the three-judge panel of the district court.

³⁰⁸ *Utah v. Evans, aff’d*, 534 U.S. 1038 (2001) (*Evans I*).

³⁰⁹ The use of hot-deck count imputation was previously challenged in connection with the 1980 census in *Orr v. Baldrige*, No. IP81604C, slip. op. (S.D.Ind. July 1, 1985). The district court in that case upheld its use. For a summary of the lawsuit, see U.S. Census Bureau, *1980 Census of Population and Housing, History, Part E*, PHC80-R-2E (Washington, DC: Government Printing Office, 1989), pp. 10-8–10-9.

³¹⁰ *Utah v. Evans*, No. 2:01CV00292G, in the U.S.D.C. for the District of Utah, Central Division (*Evans II*), Complaint for Declaratory and Injunctive Relief, ¶ 41.

Background Information ³¹¹

Count imputation in Census 2000 consisted of three distinct processes.³¹² The first, known as status imputation, was designed by the Census Bureau to be used when it has ambiguous or conflicting information about the existence of a structure at a reported address or about the function of the structure—a housing unit as opposed to, say, a business establishment. The Census Bureau knows from past experience that some percentage of these questionable addresses are actual housing units; thus the accuracy of the census would decrease if the agency were to assume that none of them existed and deleted them all from the master address file (MAF). Instead, the agency uses the statistical process known as “hot-deck” imputation to assign a status—nonexistent, vacant, or occupied.

Under the assumption that housing unit status and household size are most similar among housing units that are close to each other, the Census Bureau uses the status (nonexistent, vacant, or occupied) of the geographically closest address and imputes that status to the unit/address with unknown status. Because the “donor” pool contains status information—obtained through enumerator-completed forms—from the continuously updated census files, this imputation method is known as “hot-deck.” Thus, through the process of status imputation, housing units/addresses that previously had unknown statuses are deemed nonexistent, vacant, or occupied. If the unit is imputed as occupied, then the size (population count) of the donor household is assigned to the unit.

The second imputation process is used when a housing unit is known to exist, but the Census Bureau has ambiguous or conflicting information about whether or not the unit is occupied and therefore cannot determine the occupancy situation. The Census Bureau knows that some number of these housing units are actually occupied, so decreased accuracy would result if the agency were to assume that all of them were vacant and thus assign a “zero” population count to the units. Instead, the Census Bureau again uses “nearest neighbor” hot-deck imputation, with the donor pool being enumerator-completed forms for vacant and occupied housing units. Thus, a housing unit with previously undetermined occupancy is imputed as either vacant or occupied. Again, if it is imputed as occupied, it takes the household size of the donor unit.

The Census Bureau carries out the third imputation process when no information is known about the inhabitants of an occupied housing unit. Once again, given that the Census Bureau knows these units to be occupied, it would result in decreased census accuracy if the agency did not assign a nonzero population count to these units. Thus, nearest-neighbor hot-deck imputation is used to assign that count from enumerator-completed forms of occupied units with a known population count.

The Census Bureau carries out these count imputation processes separately for single-unit versus multiple-unit dwellings. In a subsequent operation called substitution, short-form characteristics are imputed for the count-imputed households.³¹³

In Census 2000, count imputation accounted for approximately 0.4 percent (1.2 million persons) of the nation’s total population of 281.4 million.³¹⁴ Count imputation increased the population of North Carolina by 0.4 percent, but Utah’s population by only 0.2 percent.³¹⁵

³¹¹ This summary of count imputation is based on information contained in the “Imputation” section of Chapter 6, “Data Capture and Processing.”

³¹² The three processes of count imputation were actually carried out in the reverse order from which they are described here. That is, those housing units requiring household size imputation were processed first, followed by those requiring occupancy status imputation, and then units/addresses subject to housing unit status imputation were processed last.

³¹³ Substitution is also used in instances when the household size is known, but all the characteristic data are missing. In the substitution process, the person records of a nearby fully enumerated household of the same size are used to fill in the missing data. The selection of the hot-deck for substitution is independent from the selection process used for count imputation.

³¹⁴ *Utah v. Evans*, 536 U.S. 452 (2002).

³¹⁵ *Ibid.*

Legal Proceedings

Plaintiffs filed this suit in the U.S. District Court for the District of Utah, Central Division. Donald Evans, Secretary of the U.S. Department of Commerce, and William G. Barron, Acting Director of the U.S. Census Bureau, were named as defendants. Plaintiffs contended that they had standing to bring the action under P.L. 105-119, Section Title II, 209(b), based on their claim that they were “aggrieved by the use of any statistical method in violation of the Constitution or any provision of law . . . in connection with the 2000 or any later decennial census, to determine the population for purposes of the apportionment or redistricting of Members in Congress. . . .”³¹⁶

In their complaint, the plaintiffs claimed that count imputation was a form of statistical sampling, which, based on the Supreme Court’s interpretation of Title 13, U.S. Code, Section 195 in *Department of Commerce v. U.S. House of Representatives* (summarized above), could not be used in producing the apportionment counts.³¹⁷ Plaintiffs claimed that “[l]ike the methodology struck down by the Supreme Court, [count] imputation attempts to estimate persons who are not actually enumerated by traditional methods of enumeration. It seeks to do so by use of a sample or statistical model.”³¹⁸

Additionally, plaintiffs claimed that the use of count imputation was in violation of the Census Clause of the Constitution, as amended by Section 2 of the Fourteenth Amendment to the Constitution. The Census Clause references the conduct of an “actual Enumeration.”³¹⁹ Plaintiffs contended that “[d]efendants violated these constitutional requirements in supplementing the actual enumeration of the 2000 apportionment population with statistical sampling estimates under the imputation methodology.”³²⁰

In a supplemental filing, plaintiffs had noted, and defendants did not dispute, that the use of imputation for housing unit status caused the harm for which they sought redress. That is, some number of units the existence of which could not be confirmed, were imputed as occupied and assigned a population count from donor housing units. While plaintiffs also challenged count imputation in general, had the population counts from status imputation not been included in the apportionment totals, the last House seat would have been awarded to Utah instead of North Carolina.³²¹

Plaintiffs contended that defendants’ illegal and unconstitutional action had deprived the State of Utah and its citizens of their rightful representation in the U.S. House of Representatives and was an arbitrary and capricious final agency action and therefore in violation of the Administrative Procedure Act (APA). Thus, plaintiffs sought the following relief:

- (1) A declaration that the use of count imputation was in violation of Title 13, U.S. Code, Section 195; P.L. 105-119, Title II, Section 209; the APA; and the Census Clause of the Constitution, as amended by Section 2 of the Fourteenth Amendment.
- (2) An injunction requiring the defendants to remove from the apportionment counts the data obtained through count imputation; and submit revised apportionment counts (and the associated apportionment) to the President, who sends an apportionment statement to the Clerk of the U.S. House of Representatives that indicates the number of seats to which each state is entitled.³²²

³¹⁶ 111 Stat. 2481.

³¹⁷ The text of § 195 is provided in this section’s summary of *U.S. House of Representatives*.

³¹⁸ Complaint at ¶ 36.

³¹⁹ U.S. Constitution, Article I, Section 2, Clause 3.

³²⁰ Complaint at ¶ 44.

³²¹ *Utah v. Evans*, 182 F.Supp.2d 1165, 1170 (D.Utah Nov. 1, 2001).

³²² Complaint, p. 15.

Pursuant to plaintiffs' request, a three-judge panel of the district court was convened to hear the case. Given their obvious interest in the outcome of the case, the State of North Carolina, its governor, lieutenant governor, attorney general, the majority and minority leaders of the two houses of the North Carolina legislature, and the state's entire congressional delegation intervened in the case on the side of defendants.³²³

On November 1, 2001, in a split decision, the three-judge panel of the district court granted defendants' and defendant-intervenors' cross-motions for summary judgment.³²⁴ The three-judge panel cited *Franklin v. Massachusetts*³²⁵ in finding that plaintiffs had standing to bring their claims under the Census Act and Constitution;³²⁶ however, the panel also relied on that case in determining that plaintiffs could not make a claim under the APA.³²⁷

In deciding the merits of plaintiffs' claims, the panel noted that the parties in *Orr v. Baldrige* (see footnote 309) agreed, as did that court, that count imputation was not sampling.³²⁸ The panel also rejected the dissenting opinion of Judge Greene (the third judge on the panel), who determined that imputation was statistical sampling and made much of the fact that the Census Bureau, in its 1997 "Report to Congress," appeared to blur whatever distinction exists between sampling and imputation. The panel did acknowledge, however, that the report, for example, discusses the historical use of "statistical methods," making specific reference to the use of count imputation in past censuses, in a subsection entitled "Reliance on Sampling in Previous Censuses." But the panel reasoned that simply because the Census Bureau, at a time when it was trying to mollify the concerns of many members of Congress over the planned uses of sampling in Census 2000, used the strategy of tying together the uses of sampling and imputation under the rubric of "statistical methods," did not mean that the agency does not distinguish between these two methodologies.³²⁹ Thus, the court determined that count imputation was not statistical sampling, and therefore was not prohibited by Title 13, U.S. Code, Section 195 from being used in producing the apportionment counts.³³⁰

With regard to plaintiffs' claim that the Constitution's reference to an "actual Enumeration" precluded the use of any statistical estimation in conducting the decennial census for apportionment purposes, the panel rejected this claim, noting that the Supreme Court held in *Wisconsin v. City of New York* (discussed above) that the Census Clause vests virtually unlimited discretion in the Congress in determining the "manner" in which the census is to be carried out.³³¹ In Title 13, Congress delegated that broad authority to the Secretary of Commerce. The panel further noted that the Court held in *Wisconsin* that the Secretary's decisions regarding the conduct of the decennial census ' . . . need bear only a reasonable relationship to the accomplishment of an actual enumeration of the population, keeping in mind the constitutional purpose of the census.'³³² Thus, characterizing the use of hot-deck count imputation in Census 2000 as a "narrowly tailored" use of a statistical methodology, the panel summarized part of Justice Stevens' dissenting opinion in *U.S. House of Representatives* in holding that " . . . statistical methodologies [that are] used to improve the accuracy of the census count . . . were consonant with the Constitutional requirement of an 'actual enumeration'."³³³

Plaintiffs appealed the district court ruling to the U.S. Supreme Court. The Court decided to determine the issue of standing at the same time that it considered the merits of the case. The Court held oral argument on March 27, 2002, and issued its decision on June 20, 2002.

The Supreme Court ruled that hot-deck count imputation was not statistical sampling and therefore its use in producing the apportionment counts did not violate Title 13, U.S. Code, Section

³²³ *Utah v. Evans*, 182 F.Supp.2d 1165.

³²⁴ *Ibid.*, p. 1167.

³²⁵ 505 U.S. 788 (1992).

³²⁶ *Utah v. Evans*, 182 F.Supp.2d 1171.

³²⁷ *Ibid.*, p. 1172.

³²⁸ *Ibid.*, p. 1176.

³²⁹ *Ibid.*, pp. 1177–78.

³³⁰ *Ibid.*, p. 1178.

³³¹ *Ibid.*, p. 1179.

³³² *Ibid.*, citing *Wisconsin v. City of New York*, 517 U.S. 20.

³³³ *Ibid.*, p. 1180. It should be noted that the majority in *U.S. House of Representatives* did not address the constitutionality of the use of sampling in producing the apportionment counts.

195. Additionally, the Court ruled that the use of count imputation did not violate the Census Clause as amended by Section 2 of the Fourteenth Amendment to the Constitution.³³⁴

Justice Breyer delivered the Opinion of the Court, in which Chief Justice Rehnquist and Justices Stevens, Souter, and Ginsburg joined. Justice Scalia issued a dissenting opinion; Justice O'Connor issued an opinion concurring in part and dissenting in part; and Justice Thomas, joined by Justice Kennedy, issued an opinion concurring in part and dissenting in part.

The Court held that plaintiffs here, as in *Franklin*,³³⁵ had standing to challenge the apportionment after the President had transmitted to the Clerk of the U.S. House of Representatives the apportionment statement declaring the number of seats in the Congress to which each state was entitled. Justice Scalia, who filed an opinion in *Franklin* that concurred in part and concurred in judgement and in which he concluded that plaintiffs there could not establish standing, dissented in the present case for the same reasons. He argued that even if the Court were to order the Secretary of Commerce to recalculate the census numbers to exclude the counts that resulted from imputation and submit those revised apportionment counts to the President, the President's role in the process was not purely ministerial and thus he was under no obligation to "obediently follow the advice of his subordinates"³³⁶ and accept the revised apportionment counts for purposes of producing a new apportionment statement. Thus, as in *Franklin*, Justice Scalia argued that because it would be entirely speculative to assume the President would accept the revised counts and issue a new reapportionment statement, and given that the Court could not order him to do so, the Court would not be likely to effect the redress plaintiffs sought, and therefore they could not establish standing.³³⁷

In addition to this defect in plaintiffs' ability to establish standing, defendant-intervenor North Carolina had argued—and Justice Scalia agreed—that the statute governing the reapportionment process, Title 2, U.S. Code, Section 2a, effectively precluded redress. That statute states, in relevant part: "Each State shall be entitled, . . . until the taking effect of a reapportionment under this section or subsequent statute, to the number of Representatives shown in [that] statement."³³⁸

Once again, Justice Scalia argued that the Court would not be likely to effect redress, because, according to the language of Section 2a(b), once the President produced the apportionment statement, the number of seats to which each state was entitled could not be changed until the reapportionment following the next census (2010) unless Congress enacted a statute in the interim providing for a new reapportionment. Given that the Court would have little to no basis for assuming that Congress would pass (and the President would sign) such legislation, and noting that the Congress could not be ordered to do so,³³⁹ Justice Scalia contended that this statutory constraint to changing the apportionment also created an insurmountable hurdle for plaintiffs to be able to establish standing.

Countering Justice Scalia's argument regarding Title 2, U.S. Code, Section 2a, the majority found that, as in *Franklin*, the statute's provisions do not preclude revision of the apportionment statement under other circumstances, such as in cases of error, including those of ". . . court-determined legal error leading to a court-required revision of the underlying Secretarial 'report'."³⁴⁰ Following the issuance of the "new" census report, ". . . the relevant calculations and consequent apportionment-related steps would be purely mechanical . . .,"³⁴¹ according to the

³³⁴ *Utah v. Evans*, 536 U.S. 452 (2002).

³³⁵ In *Franklin*, the Supreme Court upheld the inclusion of overseas federally affiliated households in the 1990 census apportionment counts. Plaintiffs had challenged this action after reapportionment took place and argued that they lost a House seat as a result of the inclusion of these households in the apportionment counts. As relief, they requested that the Court order the Secretary of Commerce to exclude those households and submit revised counts to the President for issuance of a new apportionment statement. *Franklin v. Massachusetts*, 505 U.S. 788 (1992).

³³⁶ *Utah v. Evans*, 536 U.S. 511 (2002).

³³⁷ *Ibid.*

³³⁸ 2 U.S.C. § 2a(b).

³³⁹ *Utah v. Evans*, 536 U.S. 512 (2002).

³⁴⁰ Opinion of the Court, p. 462. Justice Scalia, however, found the Court's reading of the statute to permit revisions under these other circumstances to be "an astonishing exercise of raw judicial power." Dissenting Opinion of Justice Scalia, p. 513.

³⁴¹ Opinion of the Court, p. 463.

majority. Thus, the Court determined, “[u]nder these circumstances it would seem, as in *Franklin*, ‘substantially likely that the President and other executive and congressional officials would abide by an authoritative interpretation of the census statute and constitutional provision. . . .’”³⁴² The majority therefore concluded that Title 2, U.S. Code, Section 2a did not pose a bar to plaintiffs’ ability to obtain redress from the Court.

With regard to the merits of the case, the Court first addressed plaintiffs’ claim that the use of count imputation for apportionment purposes violated Title 13, U.S. Code, Section 195. The Court held that count imputation was not statistical sampling and provided the following explanation regarding the differences between the two methodologies:

The nature of the Bureau’s enterprise [count imputation] was not the extrapolation of the features of a large population from a small one [sampling], but the filling in of missing data as part of an effort to count individuals one by one. . . . The Bureau’s methodology was not that typically used by statisticians seeking to find a subset that will resemble a whole through the use of artificial, random selection processes; but that used to assure that an individual unit (not a ‘subset’), chosen nonrandomly, will resemble other individuals (not a ‘whole’) selected by the fortuitous unavailability of data. . . . And the Bureau’s immediate objective was the filling in of missing data; not extrapolating the characteristics of the ‘donor’ units to an entire population.³⁴³

Justice O’Connor, in her opinion concurring in part (agreeing that plaintiffs had established standing) and dissenting in part, concluded that count imputation was sampling and thus its use in producing the apportionment counts was prohibited.³⁴⁴ Using the definition of sampling in the Census Bureau’s 1997 “Report to Congress”—“In our common experience, ‘sampling’ occurs whenever the information on a portion of a population is used to infer information on the population as a whole.”³⁴⁵—Justice O’Connor argued that the data from the donor pools, a portion of the population, was used to “infer information on the population as a whole,” specifically, the “. . . overall number of people in the population who had not responded (or had not provided a consistent response). . . .”³⁴⁶ Thus, she concluded that count imputation constituted sampling.

Justice O’Connor also contended that the majority conceded that the “. . . sampling at issue in *U.S. House of Representatives* differs ‘in degree if not in kind’ from the imputation at issue here,”³⁴⁷ and she noted that the Court had “. . . already decided that the *extent* [emphasis in original] of the Bureau’s reliance on sampling is irrelevant,” holding that “. . . § 195 prohibits sampling for apportionment purposes regardless of whether it is used as a ‘substitute’ for or ‘supplement’ to a traditional enumeration.”³⁴⁸

The Court also concluded that the language of the provision—including the use of the words “known as” and the quotation marks around the word “sampling”—suggests that a term of art with a precise meaning was intended, and therefore implies that a broader definition of sampling as Justice O’Connor attempts to apply was not the intent of Congress.³⁴⁹ Furthermore, the majority stated that, with regard to the legislative history, the word “sampling” in the provision should be read as the “sampling” that the Secretary of Commerce had in mind when that provision became law in 1958. Although the Census Bureau had been using what we now call “long-form” sampling in the census since 1940, the Secretary had requested that the Congress add this provision to make clear that the Secretary of Commerce had the legal authority to collect some of the detailed information in the census on a sample basis. Thus, it is apparent, the Court reasoned, that the “sampling” referred to in the provision is this “sampling,” the practice of which the

³⁴² *Ibid.*, citing the Opinion of Justice O’Connor in *Franklin*, 505 U.S. 803.

³⁴³ *Ibid.*, pp. 466–67.

³⁴⁴ Opinion of Justice O’Connor, p. 480.

³⁴⁵ *Ibid.*, p. 482, citing U.S. Census Bureau, “Report to Congress—The Plan for Census 2000,” July 1997, revised and reissued August 1997, p. 23. However, it should be noted that, later on in that same paragraph, the Census Bureau states: “Among professional statisticians, the term ‘sample’ is reserved for instances when the selection of the smaller population is based on the methodology of their science.”

³⁴⁶ *Ibid.*, p. 483.

³⁴⁷ *Ibid.*, pp. 483–84.

³⁴⁸ *Ibid.*, p. 483, citing *U.S. House of Representatives*, 525 U.S. 342.

³⁴⁹ Opinion of the Court, p. 467.

Secretary sought to have established in statute. In obtaining Congress's support, the Secretary of Commerce did not object to a prohibition in the provision on the use of sampling for purposes of determining the congressional apportionment counts.³⁵⁰

Because count imputation was not under consideration when this provision was enacted into law, the Court reasoned, it was not Congress's intent for it to apply to that methodology. In fact, had the Secretary thought that the provision applied to apportionment-related count imputation, he likely would have objected, as the Census Bureau had used such imputation in the past and planned to continue to do so, according to the majority.³⁵¹ Finally, the Court noted that the Census Bureau had, for a long time, consistently interpreted this provision as permitting count imputation and the Congress, while being aware of this interpretation and the Census Bureau's use of this methodology for apportionment purposes, had not attempted to change the statute in this regard.³⁵²

Justice O'Connor countered these arguments by contending that it is unlikely that Congress had intended such a narrow interpretation of what constitutes sampling when § 195 is viewed as a continuation of the prohibition against methodologies other than a traditional enumeration. Furthermore, she argued that when Section 195 is viewed as an authorization to “. . . permit the utilization of something less than a complete enumeration, as implied by the word ‘census’ . . .”, for purposes other than apportionment, there is no reason to believe that Congress intended to narrowly define “sampling” and thereby tightly restrict the methodologies by which the Census Bureau could collect data for nonapportionment purposes.³⁵³

As to the constitutional question, the Court held that the Census Clause, as amended by Section 2 of the Fourteenth Amendment to the Constitution, does not preclude the use of count imputation in producing the apportionment counts.

The majority did not accept plaintiffs' argument—with which Justices Thomas and Kennedy agreed—that the phrase “actual Enumeration” in the Census Clause was a prohibition of the use of estimation methods, including count imputation, for producing the apportionment counts. According to this argument (see below for a summary of Justice Thomas's opinion), in order to pass constitutional muster, the census has to be an “actual” enumeration—that is, a count only—that does not employ inference or estimation.

The Court maintained that this interpretation is based on a misunderstanding of the context in which the word “actual” was being used by the framers of the Constitution. Because the first Congress would be convened prior to the taking of the first census, the apportionment for that Congress would be based on a rough estimate of the population, without any attempt to conduct a count of the population. Thus, the word “actual” was used to distinguish the constitutionally mandated census, which would be an “actual” enumeration, from the conjectural basis for determining the composition of the first Congress.³⁵⁴

Additionally, the Court reasoned that the framers did not intend to define or limit the methodology of the census by using the phrase “actual Enumeration”; on the contrary, they gave wide latitude to the Congress in defining the methodology: “. . . in such Manner as they [the Congress] shall by Law direct.”³⁵⁵ As did the three-judge panel of the district court, the majority cited *Wisconsin* in support of this proposition.³⁵⁶

Furthermore, the Court determined that the framers' various decisions regarding use of a periodic census as a basis for distributing power in the U.S. House of Representatives among the states suggested a strong constitutional interest in the accuracy of such an enumeration. Bearing this in

³⁵⁰ Ibid., pp. 468–69.

³⁵¹ Ibid., p. 469. There appears to be some misunderstanding on this point. Citing the declaration of Howard Hogan of the Census Bureau, Justice O'Connor states that, at the time this provision was being considered, the “. . . Bureau had never before added people to the apportionment count using that process [imputation].” Opinion of Justice O'Connor, p. 486.

³⁵² Opinion of the Court, p. 472.

³⁵³ Opinion of Justice O'Connor, p. 486, citing U.S. House of Representatives, 85th Cong., 1st Sess., 1957, H. Rept. 85-1043, p. 10.

³⁵⁴ Opinion of the Court, p. 475.

³⁵⁵ U.S. Constitution, Article I, Section 2, Clause 3.

³⁵⁶ Opinion of the Court, p. 474.

mind, the majority reasoned that this emphasis favors the last-resort use of imputation, given that it improves the accuracy relative to the alternative suggested by plaintiffs; that is, where the population count of a housing unit is not known, the count must be recorded as zero in all cases. The Court's conclusion that the count imputation procedure succeeded in improving accuracy was based on evidence it cited from the Census Bureau's postcensus research.³⁵⁷

Justice O'Connor questioned this conclusion, noting that the Census Bureau had admitted that numeric accuracy drives the census planning process. She pointed out that no one had provided evidence that the use of count imputation improved distributive accuracy, and she cited the decision in *Wisconsin* in which the Court noted the importance of distributive accuracy:

. . . a preference for distributive accuracy (even at the expense of some numerical accuracy) would seem to follow from the constitutional purpose of the census, viz., to determine the apportionment of the Representatives among the States.³⁵⁸

In his opinion concurring in part (agreeing with the Court that count imputation was not sampling) and dissenting in part, Justice Thomas argued that the framers chose their words with precision when they wrote the phrase "actual Enumeration" into the Constitution. Countering the majority's argument regarding the meaning of the word "enumeration," Justice Thomas contended that the word "[e]numeration" meant at the time of the founding, as it does now, to count individually and specifically and simply does not admit of various counting methodologies.³⁵⁹

Justice Thomas argued that the framers were aware that calculations of population could be and often were manipulated for political or financial gain and that the use of estimation left the door open to such abuse.³⁶⁰ Thus, he noted that the framers' debates about issues relating to the census and apportionment focused on developing a standard in the Constitution that would minimize the possibility of manipulation.³⁶¹ Justice Thomas contended that the framers were quite aware that estimation could be used to supplement the enumeration, but instead they chose to require an "actual Enumeration," because, despite the majority's assertion that there was a strong constitutional interest in accuracy, ". . . the Framers placed a higher value on preventing political manipulation."³⁶²

The majority countered the argument by Justice Thomas regarding the susceptibility to manipulation, at least as it pertained to the present case, by finding that it would be difficult to use count imputation to manipulate the apportionment data for political gain because it would not be clear in advance as to which states would gain or lose as a result of its use. Justice O'Connor, on the other hand, argued that ". . . in every census where imputation would alter the resulting apportionment, the mere decision to impute or not to impute is a source of possible manipulation."³⁶³

Justice Thomas concluded that "[b]y accepting one method of estimation [count imputation] as constitutionally permissible, the Court has opened the door, and we will be continually called to judge whether one form of estimation is more acceptable than another."³⁶⁴ The Court acknowledged that it had failed to define the "precise methodological limits foreseen by the Census Clause," but held that "those limits are not exceeded" by the use of count imputation in producing the Census 2000 apportionment counts.³⁶⁵

³⁵⁷ Ibid., p. 478, citing U.S. Census Bureau, "Initial Research on Count Imputation in Census 2000," Census 2000 Informational Memorandum No. 110, August 10, 2001.

³⁵⁸ Opinion of Justice O'Connor, p. 488, citing *Wisconsin*, 517 U.S. 20.

³⁵⁹ Opinion of Justice Thomas, p. 493, fn. 5. The Census Bureau does not dispute that count imputation is a form of estimation (ibid., p. 490) and, as Justice Thomas states, ". . . estimation . . . by definition cannot be an actual counting of persons." Ibid., p. 507.

³⁶⁰ Ibid., pp. 500–502 and 507.

³⁶¹ Ibid., pp. 500–503.

³⁶² Ibid., p. 506.

³⁶³ Opinion of Justice O'Connor, p. 487. Although she did not explicitly address the constitutionality of using count imputation in producing the apportionment data, she noted that Justice Thomas's arguments did "raise[] a difficult constitutional question." Ibid.

³⁶⁴ Opinion of Justice Thomas, pp. 509–10.

³⁶⁵ Opinion of the Court, p. 479.

City of Los Angeles v. Evans. In October 2000, the Clinton administration finalized a rule governing the Census 2000 redistricting data adjustment decision.³⁶⁶ Under the rule, the Secretary of Commerce delegated to the Census Bureau Director the authority for making the determination as to whether the official redistricting data would incorporate a statistical adjustment. The rule provided that “[t]he determination of the Director of the Census shall not be subject to review, reconsideration, or reversal by the Secretary of Commerce.”³⁶⁷ On February 16, 2001, the Secretary of Commerce under President George W. Bush, Donald Evans, signed a rule rescinding the delegation of authority.³⁶⁸

On February 21, 2001, the City of Los Angeles and other plaintiffs filed suit in the U.S. District Court for the Central District of California, claiming that the Secretary’s changes to the rule governing the Census 2000 redistricting data adjustment decision were in violation of the Administrative Procedure Act’s (APA) notice and comment requirements for making other than minor amendments to a substantive rule.

The plaintiffs filed their lawsuit after the final rule was signed and prior to its publication in the *Federal Register*. They contended that the revocation constituted a substantive change to the rule, given that the purpose of the October 2000 final rule was to “. . . insulate from partisan politics the final determination of which census data should be released. . . .”³⁶⁹ Plaintiffs also noted that the original rule ensured that the adjusted data would be released if a Census Bureau committee of senior career professionals (known as the Executive Steering Committee for Accuracy and Coverage Evaluation Policy, or ESCAP) recommended their use for redistricting, notwithstanding a subsequent decision by senior management in favor of the use of unadjusted data for redistricting.³⁷⁰

Plaintiffs requested a temporary restraining order and preliminary and permanent injunctions prohibiting the new rule from taking effect. On February 23, the district court denied plaintiffs’ motion for a temporary restraining order.

On March 12, 2001, following the Secretary’s decision to release the unadjusted data as the official redistricting data and to not release the adjusted data,³⁷¹ the City of Los Angeles and its coplaintiffs amended their complaint. Plaintiffs contended that the Secretary’s adjustment decision should be declared void because of the alleged improper revocation of the delegation of authority³⁷² and that Section 195 of Title 13 required release of the adjusted data because it was “. . . unassailably ‘feasible’ to adjust the census data using sampling . . . and the majority of the evidence indicates that the adjusted data are more accurate.”³⁷³ Plaintiffs therefore requested that the court require the Secretary to release also the adjusted data as the official redistricting data.³⁷⁴

³⁶⁶ P.L. 94-171 (Title 13, U.S. Code, Section 141(c)) mandates that the redistricting data are to be provided to the states and localities within 1 year of Census Day.

³⁶⁷ *Federal Register*, Vol. 65, No. 195 (October 6, 2000) (Final Rule), p. 59716.

³⁶⁸ *Federal Register*, Vol. 66, No. 37 (February 23, 2001) (Final Rule), pp. 11231–33. Both this rule and the prior rule are discussed in more detail in the section of this chapter entitled “The Debate Over the Use of Sampling.”

³⁶⁹ *City of Los Angeles v. Evans*, No. CV 01-1671, in the U.S.D.C. for the Central District of California, Complaint for Declaratory and Injunctive Relief, ¶ 27.

³⁷⁰ For information about the genesis and charge of the ESCAP, see “The Debate Over the Use of Sampling” section.

³⁷¹ See “The Debate Over the Use of Sampling” section for a discussion of the Secretary’s adjustment decision.

³⁷² Memorandum in Support of Plaintiffs’ Renewed Application for Temporary Restraining Order and Order to Show Cause Re Preliminary Injunction, p. 7.

³⁷³ *Ibid.*, p. 1. While the ESCAP did state that “. . . the majority of the evidence indicates . . . the superior accuracy of the adjusted numbers . . .” (*Federal Register*, Vol. 66, No. 46 (March 8, 2001), p. 14005), the committee identified a number of concerns regarding the accuracy of the data that required additional investigation. The Census Bureau later determined that the adjusted data were “. . . so severely flawed that all potential uses of these data would be inappropriate.” U.S. Census Bureau, “Requests for Adjusted Data from Census 2000,” memorandum for executive staff and all divisions, from Preston Jay Waite, Associate Director for Decennial Census, December 6, 2002 (attachment). See “The Debate Over the Use of Sampling” section of this chapter for additional discussion on this issue.

³⁷⁴ Memorandum in Support of Plaintiff’s Renewed Application for Temporary Restraining Order and Order to Show Cause Re Preliminary Injunction, p. 2.

On April 25, Judge Gary Allen Feess of the U.S. District Court for the Central District of California dismissed the plaintiffs' complaint, thereby upholding the Secretary's decision.³⁷⁵ The plaintiffs, according to Judge Feess, had asked that the court reject the Secretary's adoption of the ESCAP's recommendation. He said that plaintiffs had argued that because Section 195 creates "a presumption of accuracy in the adjusted data" [given the feasibility determination]³⁷⁶, and given that "... the adjusted data . . . [have] not been proven inaccurate . . . [they] should be released as the official census [data]."³⁷⁷

Judge Feess said, on the other hand, that the Commerce Department had contended that the Secretary "... has discretion to reject the use of statistically adjusted data where strong evidence exists that its use will not improve the accuracy of the final census figure."³⁷⁸ Noting that "... the paramount objective of the Census Act is accuracy in counting population . . .," and the "substantial evidence" presented of the agency's concerns regarding the accuracy of the adjusted data, Judge Feess thereby concluded that the "... Secretary's actions are consistent with a permissible construction of the Census Act."³⁷⁹

The plaintiffs subsequently appealed the district court ruling to the U.S. Court of Appeals for the Ninth Circuit, and on September 27, 2002, the Ninth Circuit Court upheld the district court ruling.³⁸⁰ The Ninth Circuit ruled that

[b]ecause Congress conditioned the use of sampling on the Secretary's consideration of its feasibility, Section 195 does not create a presumption in favor of statistical adjustment of the census, nor does it require the Secretary to consider the adjusted data as the default data for Census 2000. Instead, Section 195 grants broad discretion upon the Secretary to "consider" as an initial matter what uses of sampling are 'feasible'.³⁸¹

The court concluded that "... Secretary Evan's interpretation of the statute, as permitting him to consider accuracy as a component of feasibility, was a permissible construction of the statute."³⁸²

Additionally, the Ninth Circuit Court agreed with the district court that the alleged violations of the APA's notice and comment requirements stemming from the revocation of the delegation of authority was a moot issue, because the Acting Director of the Census Bureau accepted the recommendation of the ESCAP not to use the statistically adjusted data for purposes of redistricting and, therefore, would have made the same decision as the Secretary. Thus, no harm to plaintiffs flowed from the alleged APA violations.³⁸³

³⁷⁵ *City of Los Angeles v. Evans*, No. CV 01-1671, 2001 WL 34125617 (C.D.Cal. April 25, 2001). This case was not selected for publication in the *Federal Supplement*.

³⁷⁶ For more information on this issue, see *Federal Register*, Vol. 65, No. 119 (June 20, 2000), pp. 38370-71 and 38374-98.

³⁷⁷ *City of Los Angeles v. Evans*, No. CV 01-1671, 2001 WL 34125617, at *1.

³⁷⁸ *Ibid.*

³⁷⁹ *Ibid.*, at *2.

³⁸⁰ *City of Los Angeles v. Evans*, 307 F.3d 859 (9th Cir. 2002).

³⁸¹ *Ibid.*, p. 871.

³⁸² *Ibid.*, p. 877.

³⁸³ *Ibid.*

U.S. Department of Commerce v. Carter. This lawsuit pertained to an April 20, 2001, reedom of Information Act (FOIA) request from two Oregon state senators for the Census 2000 adjusted block-level data for the entire country. As explained in more detail in the “Freedom of Information Act Requests” section of this chapter, the Census Bureau denied their request, and the denial was subsequently upheld by the Department of Commerce’s assistant general counsel for administration.

Having exhausted their administrative remedies, pursuant to the provisions of the FOIA (Title 5, U.S. Code, Section 552(a)(4)(B)), the two state senators filed suit (*Carter v. U.S. Department of Commerce* as filed) in district court on June 11, 2001.³⁸⁴ The U.S. District Court for the District of Oregon, in ruling on the case, relied on *U.S. Department of Commerce v. Assembly of California*, a FOIA lawsuit dealing with release of the 1990 census adjusted block-level data.³⁸⁵ In that case, the U.S. Court of Appeals for the Ninth Circuit ruled that the 1990 census adjusted data were neither predecisional nor deliberative. The district court in the *Carter* case held that the Census 2000 adjusted block-level data also were not predecisional nor deliberative. Finding that both these criteria must be met for the adjusted data to be protected from disclosure by the deliberative process privilege, on November 20, 2001, the court granted plaintiffs’ motion for summary judgment and ordered the defendant to release the data to plaintiffs.³⁸⁶

The Department of Commerce appealed the district court ruling to the U.S. Court of Appeals for the Ninth Circuit. Oral argument was held before the Ninth Circuit Court on September 10, 2002, and the court issued its ruling on October 8, 2002, upholding the district court order.³⁸⁷

The court noted that the district court had relied on the Ninth Circuit’s ruling in the *U.S. Department of Commerce v. Assembly of California* case for determining that the adjusted data were neither predecisional nor deliberative. The Ninth Circuit Court rejected defendant’s argument that the circumstances surrounding the Census 2000 adjustment decision were significantly dissimilar from those pertaining to the 1990 census determination, thereby warranting that the Census 2000 adjusted data be withheld. For example, defendants had argued that, following the initial decision pertaining to redistricting, the adjusted data were the subject of the deliberative process leading to the October 2001 decision on other possible uses (incorporation in sample data products, intercensal estimates, etc.) of the adjusted data. The Ninth Circuit rejected this argument, agreeing with the district court that the adjusted data themselves did not “contribute” to either decision. The court also cited *Assembly* in determining that the adjusted data could not be considered predecisional simply because the agency continued to evaluate them and/or consider them for potential future uses. The court agreed with the district court’s determination that the purported factual differences surrounding the 1990 and the 2000 adjusted data were not “legally significant.”³⁸⁸

The Department of Commerce did not appeal the Ninth Circuit ruling and subsequently released the data to the plaintiffs.³⁸⁹

³⁸⁴ *Carter v. U.S. Department of Commerce*, 186 F.Supp.2d 1147 (D.Or. Nov. 20, 2001).

³⁸⁵ 968 F.2d 916 (9th Cir. 1992). It is worth noting that the Eleventh Circuit Court of Appeals, in *U.S. Department of Commerce v. Florida House of Representatives*, 961 F.2d 941 (11th Cir. 1992), reached the opposite conclusion, holding that the 1990 census adjusted block-level data fell within the scope of the deliberative process privilege in Exemption 5 of the FOIA, and that court therefore upheld the withholding of those data. For summaries of these cases, see U.S. Census Bureau, *1990 Census of Population and Housing, History, Part D*, 1990 CPH-R-2D (Washington, DC: Government Printing Office, 1996), pp. 12-12–12-13.

³⁸⁶ *Carter v. U.S. Department of Commerce*, 186 F.Supp.2d 1147, 1148, 1153 (D.Or. Nov. 20, 2001).

³⁸⁷ *U.S. Department of Commerce v. Carter*, 307 F.3d 1084 (9th Cir. 2002).

³⁸⁸ *Ibid.*, pp. 1089–91.

³⁸⁹ U.S. Census Bureau, “Requests for Adjusted Data from Census 2000,” memorandum for executive staff and all divisions, from Preston Jay Waite, Associate Director for Decennial Census, December 6, 2002.

Waxman v. Evans. On April 6, 2001, a number of members of the U.S. House of Representatives' Committee on Government Reform, which included the Census Subcommittee, requested from the Secretary of Commerce the Census 2000 adjusted block-level data for all states by April 20, 2001.

In the letter, the committee members claimed that

[a]lthough the steering committee [the ESCAP] concluded that the adjusted numbers should not be released at that time for redistricting purposes, it reached this decision only because the impending April 1, 2001, statutory deadline prevented a full analysis of the accuracy of the adjusted data.³⁹⁰

Noting that the Government Reform Committee had legislative and oversight responsibilities for matters relating to population and demography, including the census, the committee members requested the adjusted block-level data under the "Seven Member Rule."

Under the provisions of the Seven Member Rule,

[a]n Executive agency, on request of the Committee on Government Operations [renamed the Committee on Government Reform in the 106th Congress] of the U.S. House of Representatives, or any seven members thereof, or on request of the Committee on Governmental Affairs of the Senate, or any five members thereof, shall submit any information requested of it relating to any matter within the jurisdiction of the committee.³⁹¹

The letter noted several reasons for the request for the adjusted data, including the fact that the committee was

. . . actively considering whether to amend the law regarding the timing and release of adjusted and unadjusted census data. Concerns have been raised that the existing provisions of the Census Act effectively prevent the most accurate data from being used for redistricting and other purposes. Review of the adjusted data will enable us to evaluate the need for legislation in this area.³⁹²

The Department of Commerce did not respond by the deadline set forth in the request, and the requesting committee members filed suit on May 21, 2001, in the U.S. District Court for the Central District of California to compel the release of the Census 2000 adjusted block-level data under the Seven Member Rule.³⁹³

On June 5, Secretary Evans responded to the initial request, declining to provide the adjusted data under the Seven Member Rule, stating that "[c]onsistent with the long-standing Executive Branch interpretation of this statute, in which the Congressional Research Service [CRS] has concurred, we do not believe the statute applies in this circumstance."³⁹⁴ The Secretary went on to note: "We are mindful of your stated needs for the adjusted data, however, and we are continuing to consider whether release of the data is warranted. The Department expects to make a final decision in the near future."³⁹⁵

On January 18, 2002, the U.S. District Court for the Central District of California ruled in favor of the plaintiffs and ordered Secretary Evans to provide the data to them.³⁹⁶ Plaintiffs had argued that a "plain language" reading of the statute in question required the Secretary to provide the requested data to them, giving him no discretion in responding to requests made pursuant to Section 2954 of Title 5, U.S. Code, the "Seven Member Rule."

³⁹⁰ Rep. Henry A. Waxman et al., Committee on Government Reform, U.S. House of Representatives, to Donald L. Evans, Secretary, U.S. Department of Commerce, April 6, 2001, pp. 1–2.

³⁹¹ Title 5, U.S. Code, Section 2954 (2006).

³⁹² Letter from Rep. Waxman et al., to Secretary Evans, April 6, 2001, p. 2.

³⁹³ Two of Rep. Waxman's colleagues who were signatories to the April 6, 2001, letter did not participate in the litigation. They were Reps. Paul Kanjorski (D-PA) and Jim Turner (D-TX).

³⁹⁴ Donald L. Evans, Secretary, U.S. Department of Commerce, to Rep. Henry A. Waxman, Ranking Minority Member, Committee on Government Reform, U.S. House of Representatives, June 5, 2001.

³⁹⁵ *Ibid.*

³⁹⁶ *Waxman v. Evans*, No. CV014530LGB (AJWX), 2002 WL 32377615 (C.D.Cal. Jan. 18, 2002). This case was not selected for publication in the *Federal Supplement*.

The defendant had argued that the court was being asked to resolve what was basically a dispute between the minority members of a House committee and an executive branch agency over access to the agency's files. According to the defendant, the separation of powers doctrine militated against the judiciary getting involved in and settling such skirmishes between the branches of government. Thus, the executive branch argued that the court should decline to rule on the merits and should dismiss the suit, noting that the 73-year old statute had yet to be adjudicated by a court.

Alternatively, the defendant had contended that if the court decided to rule on the merits, Section 2954 must be interpreted in the manner in which Congress intended. Rather than providing a small minority of those committees with a sweeping grant of authority to access any information in the files of agencies under their respective jurisdictions, the statute was enacted to preserve access to information contained in statutorily required reports that another section of the original statute of 1928 was abolishing. That is, the purpose of the provision was to ensure that members of the committees could, if they so requested, still obtain the underlying information that was contained in the reports to be discontinued.

Thus, defendant argued, plaintiffs were not entitled to the information they sought, because the adjusted census data did not fall within Section 2954's narrow scope. To reinforce this position, defendant noted that the CRS had similarly interpreted the provision: "The legislative history . . . indicates that the purpose of the 1928 Act was not to assert a sweeping right of Congress to obtain any information it might desire from the executive branch."³⁹⁷

The court, however, stated that "[i]n light of the fact that the purposes and policies of Section 2954 are not clearly expressed by the legislative history, this Court follows the text rather than the legislative history."³⁹⁸ "Reading the terms of Section 2954 in their ordinary and common meanings as this Court must . . .," the district court concluded that the ". . . plain language of Section 2954 mandates that the Secretary release the requested data to Plaintiffs."³⁹⁹

Defendant subsequently filed a motion for reconsideration. On March 25, the court denied the Commerce Department's motion.⁴⁰⁰ The Department of Commerce appealed the decision to the Ninth Circuit Court of Appeals on May 10.⁴⁰¹ As discussed earlier, the Ninth Circuit Court subsequently (October 2002) ruled in *U.S. Department of Commerce v. Carter* that the Census 2000 adjusted block-level data could not be withheld under the FOIA. Accordingly, the Ninth Circuit Court of Appeals vacated the district court judgment in *Waxman v. Evans* and remanded the case to the district court with instructions to dismiss the appeal as moot.⁴⁰²

Cameron County, Texas v. Evans. Cameron County, Hidalgo County, the judges for those counties, and 35 cities in Texas filed suit on May 10, 2001, in the U.S. District Court for the Southern District of Texas, Brownsville Division, claiming that Secretary of Commerce Evans did not have the authority to make the Census 2000 redistricting data adjustment decision and that Title 13, U.S. Code, Section 195 required release of the adjusted data for all purposes other than apportionment of representatives in the U.S. House.⁴⁰³ Defendants included Donald Evans as Secretary of the U.S. Department of Commerce and the U.S. Department of Commerce.

One of the plaintiffs' claims pertained to the rule that governed the decision whether the official redistricting (P.L. 94-171) data would incorporate a statistical adjustment. Plaintiffs argued that Secretary Evans violated the rule-making requirements of the Administrative Procedure Act (APA)

³⁹⁷ Defendant's Opposition to Plaintiffs' Motion for Summary Judgment and Memorandum in Support of Motion to Dismiss or, in the Alternative, Cross-Motion for Summary Judgment, p. 3. Defendant cites the CRS document as "Memorandum from American Law Division to Senate Government Operations Committee," January 15, 1975, p. 2.

³⁹⁸ *Waxman v. Evans*, No. CV014530LGB (AJWX), 2002 WL 32377615, at *9.

³⁹⁹ *Ibid.*, at *7.

⁴⁰⁰ Brief for Appellant, Statement of Jurisdiction, *Waxman v. Evans*, 2002 WL 32115555, at *1 (9th Cir. May 21, 2002) (No. 02-55825). This case was not selected for publication in the *Federal Reporter*.

⁴⁰¹ *Ibid.*

⁴⁰² *Waxman v. Evans*, Fed.Appx. 84, 2002 WL 31748590, at *1 (9th Cir. Dec. 6, 2002).

⁴⁰³ *Cameron County, Texas v. Evans*, C.A. No. B01082, in the U.S.D.C. for the Southern District of Texas, Brownsville Division, Complaint for Declaratory and Injunctive Relief, ¶ 45. It should be noted, however, that plaintiffs here only sought release of the adjusted data for federal and state funding-allocation purposes.

when he revoked portions of the existing substantive rule and promulgated a new final substantive rule (the “Evans Rule”) without providing for a notice and comment period before those actions took effect. Thus, by revoking the initial rule’s delegation of authority to the Census Bureau Director to make the redistricting data adjustment decision and issuing a new rule in which he retained such authority, the Secretary, plaintiffs argued, was not authorized to make the decision.⁴⁰⁴

As to their claim under Title 13, United States Code, Section 195, plaintiffs contended that the provision required release of the adjusted data, which were based on statistical sampling, for all purposes other than apportionment, if “feasible” (the language in that section). Secretary Evans, in deciding that the unadjusted data would be released as the official redistricting data, cited the ESCAP’s concerns regarding potential problems with the Accuracy and Coverage Evaluation (A.C.E.) methodology that may have resulted in overstated A.C.E. estimates of net undercount in Census 2000.⁴⁰⁵ However, plaintiffs quoted the ESCAP report that concluded “. . . there is considerable evidence to support the use of the adjusted data . . .” and that the A.C.E. was an “. . . efficient and effective operation that produced high quality data.”⁴⁰⁶ Thus, plaintiffs argued, the “feasibility” of the adjusted data had clearly been demonstrated and once that burden was met, Section 195 did not provide to the decision-maker the discretion to not release the adjusted data for purposes other than apportionment.⁴⁰⁷

Finally, plaintiff jurisdictions fashioned equal protection and due process claims, arguing that their populations included large numbers of Hispanics, who are known to be differentially undercounted in the census, unless it is subjected to a statistical adjustment. Thus, plaintiffs contended that defendants had arbitrarily discriminated against a protected class, in violation of the constitutional guarantee of equal protection, and that defendants’ failure to release adjusted data that would correct for the differential undercount would result in their significant loss of federal funding over the decade (an alleged due process violation).⁴⁰⁸

Plaintiffs sought the following items of relief, among others:

- (1) A declaratory judgment that the Evans Rule was arbitrary, an abuse of discretion, and invalid, and therefore Secretary Evans did not have the authority to make the redistricting data adjustment decision.
- (2) A judgment that it was feasible to release the adjusted census data, and therefore the data must be released and denominated the official census data for federal and state funding purposes.
- (3) An injunction requiring that defendants release the adjusted population counts for the plaintiff jurisdictions.⁴⁰⁹

On July 20, 2001, defendants filed a motion to dismiss or for summary judgment. With regard to the validity of the Evans Rule, defendants argued that plaintiffs’ claim was moot because the Census Bureau Acting Director, who concurred with and adopted the ESCAP recommendation to denominate the unadjusted data as the official redistricting data, would have made the same decision as the Secretary had the delegation of authority not been revoked.⁴¹⁰ As to plaintiffs’ contention that Section 195 required release of the adjusted data for purposes other than apportionment

⁴⁰⁴ Ibid., ¶¶49 and 66. For more information about the “Evans Rule” and its predecessor, see “The Debate Over the Use of Sampling” section of this chapter.

⁴⁰⁵ *Federal Register*, Vol. 66, No. 49 (March 13, 2001), p. 14521.

⁴⁰⁶ Complaint, ¶ 52. The ESCAP’s concerns were well-founded—the Census Bureau later learned that the A.C.E. did not account for a large number of census erroneous enumerations, many of which were duplicates, leading to an overstatement of the Census 2000 net undercount by at least 3 million persons. This level of error rendered the data “. . . so severely flawed that all potential uses of these data would be inappropriate.” U.S. Census Bureau, “Requests for Adjusted Data from Census 2000,” memorandum for executive staff and all divisions, from Preston Jay Waite, Associate Director for Decennial Census, December 6, 2002 (attachment). See “The Debate Over the Use of Sampling” section of this chapter for further information on the Census Bureau’s analyses revealing the severity of the level of error in the adjusted data.

⁴⁰⁷ Complaint, ¶¶ 56 and 57.

⁴⁰⁸ Ibid., ¶¶ 58–60 and ¶ 70.

⁴⁰⁹ Ibid., pp. 27–28.

⁴¹⁰ Memorandum in Support of Defendant’s Motion to Dismiss, or, in the Alternative, for Summary Judgment, July 19, 2001, p. 2.

(given that the data's "feasibility" had been ascertained), defendants contended that plaintiffs' interpretation of that section as not providing the Secretary with the discretion to reject the use of the adjusted data because of concerns regarding their accuracy was contrary to Section 195's language and the overall purposes of the statute, among other things.⁴¹¹ With regard to these first two claims, defendants noted that nearly identical claims had been rejected by the district court in *City of Los Angeles v. Evans* (No. CV 01-1671, 2001 WL 34125617 (C.D.Cal. April 25, 2001), *aff'd*, 307 F.3d 859 (9th Cir. 2002)), which is summarized above.

Furthermore, defendants' argued that plaintiffs claims with regard to the release of adjusted data for federal funding purposes were not "ripe" for adjudication because the Census Bureau was further evaluating the adjusted data and that evaluation could result in the decision to incorporate the adjusted data in the production of intercensal population estimates, which are used in the allocation formulae in the vast majority of federal funding programs.⁴¹² Finally, defendants also argued that, with regard to plaintiffs' equal protection/due process claims, plaintiffs had not established standing to bring such claims, because the claims were not specific enough to be justiciable but, rather, constituted generalized grievances.⁴¹³

In a related action, on June 27, 2001, one of the attorneys for plaintiffs filed a Freedom of Information Act (FOIA) request for the adjusted population counts for the 37 plaintiff jurisdictions and one additional Texas jurisdiction.⁴¹⁴ On July 16, 2001, the Census Bureau responded to the request, denying the requested data as "predecisional" and "deliberative" under the deliberative process privilege of Exemption 5 of the FOIA.⁴¹⁵ Plaintiffs subsequently filed an amended complaint in which they added a FOIA claim pertaining to their June 27 request.⁴¹⁶

On September 10, 2001, defendants responded to the amended complaint, filing a motion (and supporting memorandum) for judgment on the pleadings or for summary judgment. Defendants reiterated their earlier arguments on the merits, but also contended that plaintiffs were not entitled to having their FOIA claim adjudicated on the merits, not having exhausted their administrative remedies.⁴¹⁷ Furthermore, defendants argued that, even if the court were to consider the claim on the merits, the data were properly withheld under Exemption 5 of the FOIA.⁴¹⁸

On January 28, 2002, with regard to all of plaintiffs' claims except the FOIA one, the district court either ruled in favor of defendants or dismissed the claims.⁴¹⁹ As to the FOIA claim, the court noted that defendants were no longer contending that it was not "ripe" for judicial review,⁴²⁰ and rejected defendants' contention that the adjusted data were protected by the deliberative process privilege of Exemption 5, citing the district court ruling in *Carter* (discussed above) that concluded that release of the adjusted data ". . . would not reveal anything more about the deliberative process than has already been disclosed. . . ."⁴²¹ Thus, the court granted judgment in favor of the plaintiffs on the FOIA claim and ordered defendants to release the adjusted Census 2000 population counts for the plaintiff jurisdictions.⁴²²

⁴¹¹ *Ibid.*, pp. 17–18.

⁴¹² *Ibid.*, p. 9. For more information about the decision regarding possible nonredistricting uses of the Census 2000 adjusted data, see "The Debate Over the Use of Sampling" section.

⁴¹³ *Ibid.*, pp. 10–11 and 22–23.

⁴¹⁴ Rolando L. Rios, Attorney at Law, to Mr. Gerald W. Gates, FOIA Officer, Policy Office, Bureau of the Census, June 27, 2001. The city of Hildago was not one of the original plaintiffs, but the FOIA request for adjusted population counts included this jurisdiction.

⁴¹⁵ Gerald W. Gates, Chief, Policy Office, U.S. Census Bureau, to Mr. Rolando L. Rios, Law Offices of Rolando L. Rios, July 16, 2001. For more information regarding FOIA requests for the Census 2000 adjusted data, see the summary of *U.S. Department of Commerce v. Carter* above and the "Freedom of Information Act Requests" section of this chapter.

⁴¹⁶ The amended complaint added the City of Hildago as a plaintiff.

⁴¹⁷ A similar situation (failure to exhaust administrative remedies with regard to a FOIA denial) arose in the *City of Los Angeles* FOIA suit (see below) relating to the release of data from the Census 2000 service-based enumeration.

⁴¹⁸ Memorandum in Support of Defendants' Motion for Judgment on the Pleadings, or, in the Alternative, for Summary Judgment, September 10, 1991, pp. 1–3.

⁴¹⁹ *Cameron County, Texas v. Evans*, C.A. No. B01082 (S.D.Texas Jan. 28, 2002). This case was not reported.

⁴²⁰ *Ibid.*, p. 3, fn. 1.

⁴²¹ *Ibid.*, p. 13, citing *Carter v. U.S. Department of Commerce*, 186 F.Supp.2d 1157 (D.Or. Nov. 20, 2001).

⁴²² *Cameron County, Texas v. Evans*, C.A. No. B01082 (S.D.Texas Jan. 28, 2002).

On February 5, 2002, defendants filed an appeal of the district court ruling with regard to the FOIA claim in the U.S. Court of Appeals for the Fifth Circuit and requested the district court to stay its order pending appeal of the decision. On April 8, the district court granted defendants' motion for stay.⁴²³ As noted earlier in this section, on October 8, 2002, before the Fifth Circuit was able to hear defendants' appeal in the present case, the Ninth Circuit Court in *Carter* ruled that the Census 2000 adjusted data were not protected from disclosure by Exemption 5 of the FOIA.⁴²⁴ Thus, having been ordered to disclose and having actually released the adjusted data to the plaintiffs in the Ninth Circuit case, defendants voluntarily withdrew their Fifth Circuit appeal on the FOIA claim and complied with the order of the district court.

Assyrian National Congress of America v. Bureau of the Census. This suit was filed in the U.S. District Court for the Eastern District of California on March 3, 2000, by the Assyrian National Congress of America (ANCA)—an “Assyrian-American cultural organization”—and Sargon Dadesho, president of the ANCA. The defendants were the Bureau of the Census, the U.S. Department of Commerce, and the United States of America.

When the Census Bureau announced its plans for publishing Census 2000 data relating to the long-form question on ancestry, it noted that “Assyrian,” “Chaldean,” “Syriac,” and some other responses would be grouped into the category “Assyrian/Chaldean/Syriac.” Plaintiffs filed suit to challenge those plans, arguing that “Chaldean” is a religion and not an ethnic group and therefore should not be placed in the ancestry category name along with Assyrian.⁴²⁵

In the 1980 and 1990 censuses, the ancestry category “Assyrian” was used, and it included those who responded as “Chaldean.”

After 2 years of extensive research and consultations with interested parties (including plaintiffs, other Assyrians, and Chaldeans) that were held prior to Census 2000, the Census Bureau adopted the categorization plan to be used in Census 2000. This proposal was put forth by Assyrian and Chaldean representatives with whom the agency had consulted.

In their suit, plaintiffs claimed that defendants' actions were in violation of the Establishment Clause ⁴²⁶ of the First Amendment to the Constitution and Section 221(c)⁴²⁷ of Title 13, U.S. Code, and were arbitrary and capricious (the standard of review for adjudicating final agency actions under the Administrative Procedure Act (APA)).⁴²⁸

Plaintiffs sought preliminary and permanent injunctions to prevent defendants from using the planned categorization scheme with respect to the publication of ancestry data from Census 2000.⁴²⁹ They also sought a declaratory judgment that the planned classification was null and void, “arbitrary and capricious,” and unauthorized by law.⁴³⁰

In summarizing plaintiffs' claims, the defendants noted:

The present lawsuit is extraordinary in that it, unlike virtually every other challenge to the census, does not even allege that Plaintiffs have . . . [or will suffer] any concrete injuries—such as a loss of funding or a congressional representative—but merely asserts the amorphous and untenable claim that all Assyrians will somehow be stigmatized by the Census Bureau's actions.⁴³¹

⁴²³ Final Judgment and Order on Motion for Stay, April 8, 2002.

⁴²⁴ *U.S. Department of Commerce v. Carter*, 307 F.3d 1084 (9th Cir. 2002).

⁴²⁵ *Assyrian National Congress v. Bureau of the Census*, Civ. F005376 (REC/DLB), in the U.S.D.C. for the Eastern District of California, Complaint for Judicial Review and Injunctive Relief, ¶¶ VI–VII.

⁴²⁶ The Establishment Clause reads as follows: “Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof.” U.S. Constitution, Amendment I.

⁴²⁷ Title 13, U.S. Code, § 221(c) reads as follows: “Notwithstanding any other provision of this title, no person shall be compelled to disclose information relative to his religious beliefs or to membership in a religious body.”

⁴²⁸ Complaint at ¶ I.

⁴²⁹ *Ibid.*, at ¶ XIX.

⁴³⁰ *Ibid.*, at ¶¶ XV and XIX.

⁴³¹ Defendants' Memorandum in Support of Motion to Dismiss or for Summary Judgment and in Opposition to Plaintiffs' Motion for a Preliminary Injunction, May 24, 2000, p. 1.

The defendants pointed out, for example, that “[t]here is no known use of the ancestry data by Federal or State agencies to make determinations about funding or services for particular organizations or individuals.”⁴³²

Defendants argued that plaintiffs’ claims were not reviewable under the APA because (1) the challenged action was “committed to agency discretion by law,”⁴³³ (2) the Census Bureau had yet to take “final agency action” with regard to the publication of ancestry data from the Census 2000 long form,⁴³⁴ that is, plaintiffs’ claims were not “ripe” for review, and (3) the courts had held that the issuance of an agency informational report (in this case, the publication of ancestry data from Census 2000, using a particular category heading) does not constitute “final agency action” for purposes of APA review.⁴³⁵ Defendants further argued that even if their actions were reviewable under the APA, they were rational and reasonable and could not be considered arbitrary or capricious.⁴³⁶

On October 5, 2000, the district court issued an order granting defendants’ motion to dismiss or for summary judgment and denying plaintiffs’ motion for preliminary injunction.⁴³⁷ In granting defendants’ motion, the court rejected plaintiffs’ constitutional claim. However, the court found that the Census Bureau’s decision regarding the use of the category heading “Assyrian/Chaldean/Syriac” was a “final agency action” subject to review under the APA. The court held that the Census Bureau’s decision could not be characterized as “. . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law,” noting that “. . . there is a rational basis for the decision based on a consideration of relevant factors.”⁴³⁸

On October 16, plaintiffs filed a motion for reconsideration. That motion was denied by the court on November 15, 2000.⁴³⁹ Plaintiffs did not appeal the district court ruling.

Morales v. Evans. In this lawsuit, plaintiffs—five residents of Texas, all of whom were American citizens—filed their complaint on March 29, 2000, in the U.S. District Court for the Southern District of Texas, Houston Division, claiming, among other things, that the Census 2000 short- and long-form questionnaires included “numerous, extreme and outrageous questions” and that “[t]he objectionable census questions are all those which purport to demand information beyond the ‘actual enumeration’ permitted by the Constitution.”⁴⁴⁰ That is, plaintiffs contended that “[a]ll questions propounded in the short and long forms beyond the first question—asking the number of persons living at a particular address—fall into this proscribed category of data collection.”⁴⁴¹

Plaintiffs claimed that through the issuance of those questionnaires, defendants had employed an impermissible statistical method;⁴⁴² engaged in arbitrary and capricious administrative behavior

⁴³² Ibid., p. 5.

⁴³³ The Administrative Procedure Act, 5 U.S. Code § 701(a)(2).

⁴³⁴ At the time, the Census Bureau planned to publish the ancestry data from Census 2000 in the fall of 2002.

⁴³⁵ Defendants’ Memorandum in Support of Motion to Dismiss or for Summary Judgment and in Opposition to Plaintiffs’ Motion for a Preliminary Injunction, pp. 17–21.

⁴³⁶ Ibid., pp. 21–22.

⁴³⁷ *Assyrian National Congress v. Bureau of the Census*, Civ. F005376 (REC/DLB) (E.D.Cal. Oct. 5, 2000). This case was not reported.

⁴³⁸ Ibid., pp. 43–44.

⁴³⁹ Order Denying Plaintiffs’ Motion for Reconsideration, November 15, 2000.

⁴⁴⁰ *Morales v. Daley*, C.A. No. H-00-1010, in the U.S.D.C. for the Southern District of Texas, Houston Division, “Complaint for Declaratory, Injunctive and Other Appropriate Relief,” ¶¶ 7 and 8.

⁴⁴¹ Ibid., at ¶ 12.

⁴⁴² Ibid., at ¶¶ 11 and 12. Plaintiffs appear to cite § 209(b) of P.L. 105-119 (111 Stat. 2481) as providing them with a “right of action” based on their claim that they are “aggrieved by the use of any statistical method in violation of the Constitution or any provision of law . . . in connection with the 2000 or any later decennial census, to determine the population for purposes of the apportionment or redistricting of Members in Congress. . . .” Plaintiffs argue that the use of the long form to conduct the enumeration falls within the meaning of this provision and they also (erroneously) reference the Supreme Court ruling in *U.S. House of Representatives* (119 S.Ct. 765 (1999)) that held that statistical sampling could not be used to produce the congressional apportionment counts. Contrary to plaintiffs’ assertion, the fact that the Census Bureau collects additional characteristic information from a sample of the population through the long form does not mean that the apportionment counts are derived from sampling. Plaintiffs also appear to argue that because households that receive the long form are less likely to respond (at all), this circumstance will result in a “sample” census, which is prohibited by Section 195 of Title 13, U.S. Code.

(in violation of the APA); and attempted to obtain, under threat of criminal prosecution, “information which is statutorily proscribed,”⁴⁴³ and in doing so violated plaintiffs’ constitutional rights.

Plaintiffs requested the court to (1) declare as unconstitutional all questions on the Census 2000 questionnaires beyond those necessary to conduct an “actual enumeration” and (2) enjoin the Census Bureau from distributing the Census 2000 questionnaires (both the short and the long form) and collecting the information requested on them.

In response to plaintiffs’ complaint, the court granted a limited temporary restraining order, which the defendants agreed to, preventing the U.S. government from taking criminal action against plaintiffs for failing to respond to their census forms. The parties subsequently filed cross-motions for summary judgment.

The district court issued its ruling on June 7, 2000, granting defendants’ motion for summary judgment.⁴⁴⁴ Plaintiffs claimed that their rights under the First, Fourth, and Fourteenth Amendments to the Constitution were violated by the questions on the long form.⁴⁴⁵ The court rejected plaintiffs’ contention that the Constitution only permits a head count (that is, determining the number of people at each address), noting that the decennial census—from the first one in 1790—has always collected additional information such as race, sex, and age.⁴⁴⁶

With regard to plaintiffs’ equal protection claims, the court did not accept plaintiffs’ argument that they were being required, under penalty of criminal prosecution, to self-identify based on “suspect” classifications—for example, race and national origin—the use of which requires the government to provide a compelling or overriding interest for doing so. Plaintiffs had contended that the government had failed to meet that burden. In rejecting that argument, the court noted that the collection of data using classifications relating to race and ethnicity does not require the government to demonstrate a compelling interest, because the mere collection of demographic data in this manner does not constitute disparate treatment (based on those classifications) of those providing the data.⁴⁴⁷

With regard to their First Amendment claims, plaintiffs argued that the requirement, under threat of criminal prosecution, to classify themselves by race and ethnicity—classifications they found abhorrent—was an unconstitutional coercion of political speech. The court rejected this argument in part because, it noted, plaintiffs’ answers to the “offensive” classifications would not be attributable to them—under the confidentiality provisions of Title 13—and thus, it could not be said that they were “. . . being required to espouse publicly a repugnant idea or to engage in compelled speech.”⁴⁴⁸

As to the Fourth Amendment claims, plaintiff Van Fleet received the long-form questionnaire and contended that having to respond to many of the questions contained therein was a gross invasion of his privacy. He argued that the Fourth Amendment has been interpreted more broadly in recent cases to protect privacy generally, not just in the context of search and seizure.⁴⁴⁹ Furthermore, he contended the questions regarding medical conditions and difficulty in engaging in certain activities because of the existence of such conditions were particularly intrusive. In order for the government to justify such an intrusion in a noncriminal context, it must demonstrate a compelling need for the information, which it had not done, Van Fleet argued.⁴⁵⁰

⁴⁴³ *Ibid.*, at ¶ 14. Plaintiffs cite statutes (for example, the Americans with Disabilities Act of 1990) that, in other contexts, prohibit entities (including the government) from asking about an individual’s race, disabilities, etc.

⁴⁴⁴ *Morales v. Daley*, 116 F.Supp.2d 801, 821 (S.D. Texas 2000).

⁴⁴⁵ The court pointed out that plaintiffs erroneously cited the Fourteenth Amendment (Section 1), which imposes prohibitions upon the states, not the federal government. The court inferred that plaintiffs had meant to cite the Fifth Amendment. *Ibid.*, p. 803, fn 1.

⁴⁴⁶ *Ibid.*, p. 809.

⁴⁴⁷ *Ibid.*, p. 815.

⁴⁴⁸ *Ibid.*, p. 816.

⁴⁴⁹ The relevant portion of the Fourth Amendment to the Constitution reads as follows: “The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated. . . .”

⁴⁵⁰ *Morales v. Daley*, 116 F.Supp.2d 816, 817 (S.D. Texas 2000).

In responding to plaintiff Van Fleet’s Fourth Amendment contentions, the court cited a U.S. Court of Appeals for the Second Circuit ruling that held that the government’s collection of race and ethnicity data in the employment context did not have search and seizure implications and that challenging such a government data collection under the Fourth Amendment constituted a “frivolous” claim.⁴⁵¹ In addition, the court again noted that because the Census Bureau would maintain the confidentiality of Van Fleet’s responses, using them only for statistical purposes, it could not be persuasively argued that requiring him to respond to the questions on medical conditions would constitute an unreasonable invasion of his privacy.⁴⁵²

Thus, the court held that requiring respondents, under threat of criminal prosecution, to answer the questions on the Census 2000 short- or long-form questionnaire did not violate any constitutional provisions, and it granted defendants’ motion for summary judgment.

Plaintiffs subsequently filed an appeal in the U.S. Court of Appeals for the Fifth Circuit, which upheld without opinion the lower court ruling.⁴⁵³ The plaintiffs then filed a petition for writ of *certiorari* in the Supreme Court. On February 19, 2002, the Supreme Court denied plaintiffs’ *certiorari* petition.⁴⁵⁴

Lindsey v. Prewitt. In this suit, filed on April 3, 2000, in the U.S. District Court for the District of Oregon, plaintiff Charles Aaron Lindsey—a resident of the state of Oregon and U.S. citizen—challenged the conduct of Census 2000 as unconstitutional because of the inclusion of noncitizens in the counts used to determine the apportionment of the U.S. House of Representatives. Kenneth Prewitt, Director of the U.S. Bureau of the Census, was named as the defendant.

The plaintiff requested the following items of relief, among others:

- (1) A declaration that Census 2000 violates the Constitution.
- (2) A preliminary injunction enjoining the Census Bureau “. . . from using the data in any form from Census 2000 as it is currently constructed.”
- (3) A requirement for the defendant “. . . to revise and reconstruct the Census 2000 survey to follow the requirements of the United States Constitution. . . .”⁴⁵⁵ (Plaintiff argued that these requirements included obtaining the citizenship status of all census respondents for purposes of producing the apportionment counts.)

The court noted that the plaintiff did not provide any support for the proposition that the Constitution required apportionment counts to be based on the citizen population only.⁴⁵⁶ Because the court determined that the plaintiff could not show that he had or would suffer any concrete harm as a result of defendant’s actions—thus, failing to establish standing—it granted defendant’s motion to dismiss on August 8, 2000.⁴⁵⁷

Cahoon v. Bureau of the Census. On May 15, 2000, plaintiff Robert Cahoon filed a “petition” in the U.S. District Court for the Middle District of Florida, Tampa Division, objecting to receiving and being required to complete the Census 2000 long form. Plaintiff claimed that the long form violated a number of provisions of the U.S. Constitution, including the Fourth and Fourteenth Amendments. Mr. Cahoon requested the court to order the Census Bureau to rescind the long form and only issue the Census 2000 short form; prohibit any enumerator from obtaining any information other than that requested on the short form; and declare that respondents cannot be prosecuted for failing to respond to the questions on the Census 2000 long form, other than those also found on the Census 2000 short form.

⁴⁵¹ *Ibid.*, p. 820, citing *Caufield v. Bd. of Educ. of the City of New York*, 583 F.2d 612 (2nd Cir. 1978).

⁴⁵² *Ibid.*, p. 820.

⁴⁵³ *Morales v. Evans*, 275 F.3d 45 (5th Cir. 2001).

⁴⁵⁴ 534 U.S. 1135 (2002).

⁴⁵⁵ *Lindsey v. Prewitt*, Civil No. 00-6091-TC, in the U.S.D.C. for the District of Oregon, Complaint for Declaratory and Injunctive Relief, pp. 4–5.

⁴⁵⁶ *Lindsey v. Prewitt*, Civil No. 00-6091-TC (D.Or. Aug. 8, 2000), p. 3. This case was not reported.

⁴⁵⁷ *Ibid.*, p. 6.

On May 26, 2000, the district court dismissed the suit, finding the “. . . legal basis for the plaintiff’s petition indisputably meritless. . . .”⁴⁵⁸ On June 13, 2000, plaintiff Cahoon filed a notice of appeal of the district court ruling. However, on November 17, 2000, the appeal was rejected by the U.S. Court of Appeals for the Eleventh Circuit because appellant Cahoon failed to file the required documentation within the prescribed time limits.

Barnett v. U.S. Department of Commerce. On October 31, 2001, plaintiffs—three residents of the state of Illinois who were U.S. citizens—filed this lawsuit in the U.S. District Court for the Northern District of Illinois, Eastern Division, against the U.S. Department of Commerce and the Census Bureau, among others, seeking a permanent injunction to compel the Census Bureau to release, in an expedited fashion, a tabulation pertaining to the state of Illinois containing citizen voting-age population data, by race and Hispanic origin, for use in redistricting the Illinois legislature.⁴⁵⁹ The block-level P.L. 94-171 files the Census Bureau releases as the official redistricting data do not contain information on citizenship.

Plaintiffs were challenging the redistricting plan that had been adopted by the Illinois Legislative Redistricting Commission as violative of the constitutional requirement of “one person, one vote,” because, among other things, it used total voting-age population data, as opposed to citizen voting-age data.⁴⁶⁰ Plaintiffs argued that a recent U.S. Court of Appeals for the Seventh Circuit ruling in *Barnett v. City of Chicago* (141 F.3d 699 (7th Cir. 1998))—a lawsuit challenging the use of the 1990 census results to redraw the city of Chicago’s alderman districts—determined that the proper data for use in redistricting were those pertaining to the citizen voting-age population.⁴⁶¹ Thus, plaintiffs contended that the data they were requesting from the Census Bureau were required to draw a new redistricting plan that would pass constitutional muster.

On December 5, 2001, plaintiffs filed an amended complaint under the Voting Rights Act, adding a claim against new defendants, the Illinois State Board of Elections and its executive director,⁴⁶² seeking to prevent the use of the redistricting plan adopted by the Illinois Legislative Redistricting Commission in future elections of representatives and senators to the Illinois legislature.

On January 24, 2002, the federal defendants filed a motion to dismiss or, in the alternative, for summary judgment. Defendants noted that the requested tabulation (pertaining to the citizen voting-age population) did not exist and that defendant Census Bureau did not plan to produce the data at the level of geography requested by plaintiffs.⁴⁶³ Defendants argued that plaintiffs were, in effect, asking the court to require the Census Bureau to produce a special tabulation⁴⁶⁴ for them on an expedited basis. The provisions of Title 13 pertaining to special tabulations, defendants noted, provide the Secretary of Commerce with the discretion to undertake any special tabulation (subject to the confidentiality restrictions imposed by that section) and require that the

⁴⁵⁸ *Cahoon v. Bureau of the Census*, 8:00CV954T23A (M.D.Fla. May 26, 2000), pp. 1–2. This case was not reported.

⁴⁵⁹ *Barnett v. U.S. Department of Commerce*, CV No. 01C8347, U.S.D.C. for the Northern District of Illinois, Eastern Division, Complaint for Injunctive Relief, ¶ 1. On December 19, 2001, additional parties joined the suit as plaintiff-intervenors. These included two residents of Illinois who were U.S. citizens, an Illinois state representative, the Midwest Community Council, and FORUM (Fulfilling Our Responsibility Unto Mankind).

⁴⁶⁰ *Ibid.*, ¶¶ 30 and 32.

⁴⁶¹ *Ibid.*, ¶ 23.

⁴⁶² Initially, plaintiffs’ claims against state of Illinois defendants were part of a separate complaint against those entities, which the plaintiffs later withdrew.

⁴⁶³ Plaintiffs did not specify the level of geography in their complaint, but later requested the data at the block-group level in a discovery request. In 1990, the Census Bureau released citizen voting-age data at the block-group level as a data product. These data were only provided by race as a special tabulation (see discussion in the text). Because Census 2000 respondents were permitted to mark one or more race categories, the presentation of race data includes 63 possible race groups (all of the possible single and multiple responses to the race question). The Census Bureau noted that this circumstance made it unlikely that the agency would be able to release—because of the risk that the data pertaining to a particular respondent could be identified—Census 2000 citizen voting-age population data by race at the geographic level that it did in 1990. Summary File 4, which at the time was scheduled for release between October 2002 and February 2003, would contain the data plaintiffs sought, but at the census tract level. Declaration of Preston Jay Waite in Support of Motion to Dismiss or for Summary Judgment, ¶¶ 15–17, Exhibit A to Federal Defendants’ Statement of Material Facts as to Which There Is No Genuine Issue, January 24, 2002.

⁴⁶⁴ The Special Tabulations program is discussed in more detail in Chapter 9, “Data Products and Dissemination.”

work to produce such a tabulation be done on a cost-reimbursable basis.⁴⁶⁵ Because the Secretary's authority was discretionary, there was no statutory basis for compelling defendants to provide the tabulation to plaintiffs, making the complaint suitable for dismissal, at least with regard to federal defendants.

Furthermore, defendants pointed out that there was no federal statute requiring that states use the P.L. 94-171 or other decennial census data for redistricting purposes, so federal defendants were not responsible for the data that the state of Illinois officials used to redraw their state legislative districts. That is, the state of Illinois was not compelled by federal law to use the decennial census data in state legislative redistricting, so any alleged harm to plaintiffs as a result of the data used to conduct such redistricting was not traceable to federal defendants, but only to state officials. Thus, because federal defendants did not cause the "harm"—an unlawful and/or unconstitutional redistricting plan—for which plaintiffs sought redress, plaintiffs lacked standing to bring suit against them. After extensive procedural maneuvering, the plaintiffs withdrew the claim against federal defendants.

City of Los Angeles v. U.S. Department of Commerce. This lawsuit was filed by the City of Los Angeles on November 27, 2002, in response to the Census Bureau's withholding of particular documents and data—pertaining to the Census 2000 service-based enumeration—that the city had requested under the Freedom of Information Act (FOIA). The specifics of the city's requests and the Census Bureau's responses are discussed in the "Freedom of Information Act Requests" section of this chapter.

In August 2002, Gibson, Dunn & Crutcher (on behalf of the City of Los Angeles) filed an appeal of the Census Bureau's partial denial of the requests. Stating that the appeal was not timely filed, the Department of Commerce assistant general counsel for administration denied it. The City of Los Angeles proceeded to file suit in the U.S. District Court for the Central District of California, Western Division.

On August 27, 2004, the district court granted defendant's motion for summary judgment, agreeing with the Department of Commerce that the plaintiff had not exhausted its administrative remedies before filing suit.⁴⁶⁶ That is, the court ruled that it did not have jurisdiction to hear the case because the Department of Commerce's assistant general counsel for administration could have overturned the Census Bureau's partial denial of records—assuming the plaintiff had submitted a timely appeal—thereby obviating the need for judicial review. Thus, the City of Los Angeles would be required to initiate its FOIA request anew and would have to receive from the department a substantive response upholding the Census Bureau's denial (assuming the agency's response would remain the same) before it could proceed (again) with its lawsuit.

Other litigation. In addition to the lawsuits described above regarding Census 2000 programs, operations, methodologies, and procedures, during Census 2000 and subsequently, disputes arose over when decennial census field employees were entitled to overtime pay under the Fair Labor Standards Act, Title 29, U.S. Code, Section 207, *et seq.*, and the Federal Employees Pay Act, Title 5, U.S. Code, Section 5542, *et seq.* Some employees sued in U.S. district courts and in the U.S. Court of Federal Claims. At the time this chapter was submitted for publication, litigation regarding this issue remained pending.

⁴⁶⁵ 13 U.S.C. § 8(b).

⁴⁶⁶ *City of Los Angeles v. U.S. Department of Commerce*, CV 02-9122WMB (C.D.Cal. Aug. 27, 2004), p. 8. This case was not reported.

Table 11-6.
Summary of Litigation Relating to 2000¹

Abbreviated case name (as filed), date filed, and court of filing ²	Principal plaintiffs	Issue(s)	Resolution ³
<i>Glavin v. Clinton</i> February 12, 1998 U.S. District Court for the Eastern District of Virginia, Alexandria Division	Matthew Glavin (then- president of the South- eastern Legal Foundation); Rep. Robert Barr (R-GA); William J. Byrn, Cobb County, GA, Commission Chairman; Cobb County, GA; Bucks and Delaware Counties in Pennsylvania; DuPage County, IL; and residents of Indiana, Penn- sylvania, Ohio, Virginia, Florida, Connecticut, California, Nevada, Arizona, New Jersey, Montana, Wisconsin, and Illinois	The legality and constitu- tionality of the use of sampling to produce the apportionment counts.	The Supreme Court consoli- dated the <i>Glavin</i> case and the <i>U.S. House of Representatives</i> case and ruled that Section 195 of the Census Act (Title 13, U.S. Code) precludes the use of sampling to produce the congressional apportionment counts. The Court did not address the constitutional issues.
<i>U.S. House of Representatives v. Department of Commerce</i> February 20, 1998 U.S. District Court for the District of Columbia	U.S. House of Representatives	The legality and constitu- tionality of the use of sampling to produce the apportionment counts.	The Supreme Court dismissed the Department of Commerce's appeal in the <i>U.S. House of Representatives</i> case (although the caption of the decision case retains the name <i>Department of Commerce v. U.S. House of Representatives</i>), because it adjudicated the same substan- tive issues with respect to the plaintiffs in <i>Glavin</i> .
<i>Utah v. Evans (Evans I)</i> January 10, 2001 U.S. District Court for the District of Utah, Central Division	The State of Utah, seven Utah state government elected officials, and Utah's entire congressional delega- tion; and four residents of Utah serving overseas as Mormon missionaries at the time of Census 2000	Plaintiffs challenged as ille- gal and unconstitutional the Census Bureau's failure to include in the Census 2000 apportionment counts Mormon missionaries tem- porarily serving overseas.	In a November 26, 2001, sum- mary affirmation, the Supreme Court upheld the district court decision (April 17, 2001) reject- ing plaintiffs' statutory and constitutional claims.
<i>Utah v. Evans (Evans II)</i> April 25, 2001 U.S. District Court for the District of Utah, Central Division	Same plaintiffs as in <i>Evans I</i>	The legality and constitu- tionality of the use of "hot- deck" count imputation in producing the Census 2000 apportionment counts.	On June 20, 2002, the Supreme Court issued a decision con- cluding that the use of hot-deck count imputation to produce the apportionment counts is neither contrary to the Constitution nor Title 13, U.S. Code, Section 195, thereby upholding the November 1, 2001, district court ruling.

See footnotes at end of table.

Table 11-6.
Summary of Litigation Relating to 2000¹—Con.

Abbreviated case name (as filed), date filed, and court of filing ²	Principal plaintiffs	Issue(s)	Resolution ³
<i>City of Los Angeles v. Evans</i> February 21, 2001 U.S. District Court for the Central District of California	The cities and counties of Los Angeles and San Francisco, CA; Santa Clara County, CA; cities of San Jose and Inglewood, CA; lieutenant governor of Cali- fornia; ten Los Angeles City Council members; cities of New York, NY, Chicago, IL, Albuquerque, NM, Toledo, OH, San Antonio, TX, and Stamford, CT; mayor of Toledo, OH; minority lead- ers of the Illinois Senate; president of the Cook County (IL) Board of Com- missioners; New York City (NYC) Council; Speaker of the NYC Council; NYC Boroughs of Bronx and Brooklyn; and presidents of the NYC Boroughs of Manhattan, Bronx, and Queens	Plaintiffs challenged the revised rule under which the Secretary of Commerce, not the Census Bureau Director, would determine whether to adjust the redistricting data. Plaintiffs amended their complaint to challenge Secretary Evans' decision to release the unadjusted data as the official redistrict- ing data (Public Law [P.L.] 94-171), claiming that Title 13, U.S. Code, Section 195 required the use of sam- pling to adjust the census counts for all purposes other than apportionment. Specifically, plaintiffs requested that the court require the Secretary to release the adjusted data as the official P.L. 94-171 data.	On April 25, 2001, the district court dismissed plaintiffs' com- plaint, thereby upholding the Secretary's decision. Plaintiffs filed an appeal in the U.S. Court of Appeals for the Ninth Circuit. On September 27, 2002, the Ninth Circuit Court upheld the district court ruling with respect to the Secretary's decision and determined plaintiffs' other claims to be moot, as the revi- sions to the rule did not "cause" the injuries alleged by plaintiffs.
<i>Carter v. U.S. Department of Commerce</i> June 11, 2001 U.S. District Court for the District of Oregon	Margaret Carter and Susan Castillo, Oregon state senators	Release of the Census 2000 adjusted block-level data under the Freedom of Information Act (FOIA).	On November 20, 2001, the district court ruled the data were not protected from disclosure under the FOIA and ordered their release to the plaintiffs. The Department of Commerce (defendant) appealed that ruling to the U.S. Court of Appeals for the Ninth Circuit. On October 8, 2002, the Ninth Circuit Court upheld the district court ruling, and the defendant subsequently released the data to plaintiffs.
<i>Morales v. Daley</i> March 23, 2000 U.S. District Court for the Southern District of Texas, Houston Division	Edgar Morales and four other residents of Texas, all of whom were U.S. citizens.	Plaintiffs challenged the legality and constitutionality of being required, under threat of criminal prosecu- tion, to respond to various questions on the Census 2000 short- and long-form questionnaires.	The U.S. Court of Appeals for the Fifth Circuit upheld the dis- trict court decision (June 7, 2000) granting summary judg- ment to defendants, and on February 19, 2002, the Supreme Court declined to hear plaintiffs' appeal.

See footnotes at end of table.

Table 11-6.
Summary of Litigation Relating to 2000¹—Con.

Abbreviated case name (as filed), date filed, and court of filing ²	Principal plaintiffs	Issue(s)	Resolution ³
<i>Waxman v. Evans</i> May 21, 2001 U.S. District Court for the Central District of California	Rep. Henry Waxman and 15 other members of the House Committee on Government Reform	The release of the Census 2000 adjusted block-level data under the “Seven Member Rule” (Title 5, U.S. Code, Section 2954).	The district court found on January 18, 2002, that the plain language of the Seven Member Rule required the Secretary to release the requested data to the House Government Reform Committee members. Defendant filed an appeal in the Ninth Circuit Court of Appeals. Before that court could adjudi- cate the appeal, it had ruled in <i>U.S. Department of Commerce</i> <i>v. Carter</i> that the adjusted data could not be withheld under the FOIA, thereby rendering defen- dant’s appeal in the present case moot.
<i>Lindsey v. Prewitt</i> April 3, 2000 U.S. District Court for the District of Oregon	Charles Aaron Lindsey, a resident of Oregon and U.S. citizen	The constitutionality of including noncitizens in the census counts used for apportionment.	The district court granted defen- dant’s motion to dismiss on August 8, 2000.
<i>Cameron County, Texas</i> <i>v. Evans</i> May 10, 2001 U.S. District Court for the Southern District of Texas, Brownsville Division	Cameron and Hidalgo Counties in Texas; the judges for those counties; and 36 Texas cities	Plaintiffs challenged the revised rule under which the Secretary of Commerce, not the Census Bureau Director, would determine whether to adjust the redistricting data. Additionally, plaintiffs claimed that Title 13, U.S. Code, Section 195 required release of the adjusted data for purposes other than apportionment, but also sought release under the FOIA of the adjusted popu- lation counts for each of the plaintiff 36 cities and two counties. Plaintiffs sought use of the adjusted data for federal and state funding- allocation purposes.	On January 28, 2002, with regard to all of plaintiffs’ claims except the FOIA one, the district court either ruled in favor of defendants or dismissed the claims. On the FOIA claim, the court ordered defendants to release the adjusted Census 2000 population counts for the plaintiff jurisdictions. On February 5, 2002, defen- dants filed an appeal in the U.S. Court of Appeals for the Fifth Circuit with regard to the ruling on plaintiffs’ FOIA claim. Given the ruling in <i>Carter</i> on October 8, 2002, defendants voluntarily withdrew their Fifth Circuit appeal and complied with the order of the district court.

See footnotes at end of table.

Table 11-6.
Summary of Litigation Relating to 2000¹—Con.

Abbreviated case name (as filed), date filed, and court of filing ²	Principal plaintiffs	Issue(s)	Resolution ³
<i>Assyrian National Congress of America v. Bureau of the Census</i> March 3, 2000 U.S. District Court for the Eastern District of California	Assyrian National Congress of America (ANCA); and Sargon Dadesho, president of the ANCA	Plaintiffs challenged the legality and constitutionality of the defendant's use of the category "Assyrian/Chaldean/Syriac" in publishing responses to the long-form question on ancestry.	On October 5, 2000, the district court granted defendants' motion to dismiss or for summary judgment, rejecting plaintiffs' statutory and constitutional claims. Plaintiffs subsequently filed a motion for reconsideration, which was denied by the district court on November 15, 2000. Plaintiffs did not appeal the district court ruling.
<i>Cahoon v. Bureau of the Census</i> May 15, 2000 U.S. District Court for the Middle District of Florida, Tampa Division	Robert Cahoon	Plaintiff challenged the constitutionality of being required to complete the Census 2000 long form.	The district court dismissed the suit on May 26, 2000. Plaintiff filed an appeal in the U.S. Court of Appeals for the Eleventh Circuit, which rejected the appeal November 17, 2000, on procedural grounds.
<i>Barnett v. U.S. Department of Commerce</i> October 31, 2001 U.S. District Court for the Northern District of Illinois, Eastern Division	Richard Barnett and two other residents of Illinois, all of whom were U.S. citizens.	Plaintiffs were challenging the redistricting plan adopted by the Illinois Legislative Redistricting Commission for redistricting the Illinois legislature. They requested that the court compel the Census Bureau to provide, in an expedited fashion, a tabulation pertaining to the state of Illinois containing citizen voting-age population data, by race and Hispanic origin, for use in developing an alternative redistricting plan.	In their filings, federal defendants (the Department of Commerce, the Census Bureau, and their named officials) noted that plaintiffs were essentially requesting that the court compel the Census Bureau to produce a special tabulation of Census 2000 data, whereas the Secretary's authority for undertaking any special tabulation is discretionary (Title 13, U.S. Code, Section 8(b)). There being no statutory basis for compelling federal defendants to produce the requested tabulation, plaintiffs voluntarily withdrew their claim.
<i>City of Los Angeles v. U.S. Department of Commerce</i> November 27, 2002 U.S. District Court for the Central District of California, Western Division	City of Los Angeles	The release under the FOIA of particular documents and data pertaining to the planning and conduct of the Census 2000 service-based enumeration (SBE). Defendant had responded that the requested data tabulations did not exist, and the FOIA did not require their creation. Defendant also contended that the documents (or portions thereof) in question were properly withheld under Exemption 5 of the FOIA.	On August 27, 2004, the district court granted defendant's motion for summary judgment, agreeing with defendant that the court did not have jurisdiction to hear the case, because plaintiff had not exhausted its administrative remedies before filing suit.

¹ For detailed information about the Census 2000 lawsuits, see "Census 2000 Litigation" in the "Litigation" section of this chapter. Lawsuits discussed under "Other litigation" are not included here.

² When a lawsuit is filed, the name(s) of the party (or parties) bringing the suit—the plaintiff(s)—appears first in the case name. When a court ruling is appealed to and heard by a higher court, the name of the party filing the appeal (the "appellant") appears first in the case name, regardless of whether or not the appellant is the plaintiff. Additionally, while most of the cases summarized here involved multiple plaintiffs and/or multiple defendants, the *et al.* ("and others") that would follow the first plaintiff/defendant mentioned in the case name has been left off for the sake of convenience.

³ "Resolution" refers to the final adjudication of the case.

CONTENTS

Chapter 12.

Puerto Rico and the Island Areas

INTRODUCTION	595
Background	595
Organization of Puerto Rico and Island Areas Branch	596
PUERTO RICO	597
Introduction.	597
Geography	597
Questionnaire Content	599
Marketing and Promotion.	599
Address List Development	600
Local Update of Census Addresses 1999 program (LUCA 99) and update/leave (U/L)	600
Address list processing.	601
Address list postprocessing	601
Data Collection	601
Quality Assurance	602
Data Processing.	603
Data Products	603
ISLAND AREAS	605
Introduction.	605
Geography	606
Questionnaire Content	607
Marketing and Promotion.	610
Data Collection	610
Quality Assurance	612
Data Processing.	612
Data Products	613

Chapter 12: Puerto Rico and the Island Areas

INTRODUCTION

The decennial census is mandated by Article I, Section 2, of the U.S. Constitution, and Title 13 of the U.S. Code outlines the laws under which the census is conducted. Title 13 also specifies the geographic scope of enumeration and allows the Secretary of Commerce (and, by delegation, the Director of the U.S. Census Bureau) the discretion to enact decennial census plans subject to executive and congressional review. In addition to its stateside activities, the Census Bureau is responsible for collecting population and housing data for the Commonwealth of Puerto Rico and other areas under U.S. jurisdiction. Collectively known as the Island Areas, these areas include American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.¹

Background

With the Treaty of Paris in 1898, Spain ceded the islands of Puerto Rico and Guam to the United States. In 1899, the U.S. War Department conducted a special census of Puerto Rico, but the island was not included in the decennial census until 1910. By 1952, Puerto Rico became a commonwealth, and beginning in 1960, the United States conducted the census of population and housing as a joint project between the Census Bureau and the government of Puerto Rico. The Puerto Rico Planning Board (PRPB) serves as the liaison agency for coordinating census activities on the island. The PRPB also works with the Census Bureau to develop questionnaire content to meet the statistical needs of the commonwealth.²

Guam is an organized, unincorporated territory of the United States. Between 1898 and 1950, administration of Guam was the responsibility of the U.S. Navy; administration then was transferred to the U.S. Department of the Interior. The Organic Act of Guam in 1950 enabled Guamanians to elect their own legislature, although the President of the United States appointed Guam's governor until 1970. Since 1973, Guam has had an elected, nonvoting delegate in the U.S. House of Representatives.³ The United States conducted special censuses in Guam between 1901 and 1919; Guam's participation in the decennial census began in 1920.⁴

American Samoa consists of five major volcanic islands and two coral atolls that lie in the heart of Polynesia.⁵ It is an unorganized, unincorporated territory of the United States, acquired through a series of negotiations between 1872 and 1904. The U.S. Navy governed American Samoa until 1951 when an executive order transferred the administration of the territory to the U.S. Department of the Interior. In 1960, American Samoa adopted a constitution, and since 1981 the territory has been represented in the U.S. House of Representatives by a nonvoting delegate. The

¹ U.S. Census Bureau, "Program Master Plan: Census 2000 Island Areas," Census 2000 Informational Memorandum No. 109, March 2001, p. 3. Although American Samoa was not specified in Section 191 of Title 13 of the U.S. Code, the Office of the Geographer recommended that it be included in the decennial census as it was in 1990. See Martha Farnsworth Riche, U.S. Census Bureau, Washington, DC, to William B. Wood, Office of the Geographer and Global Issues, Department of State, Washington, DC, January 24, 1995; and William B. Wood, Office of the Geographer and Global Issues, Department of State, Washington, DC, to Martha Farnsworth Riche, U.S. Census Bureau, Washington, DC, March 6, 1995.

² In October 1958 the Census Bureau and the government of Puerto Rico came to an agreement that divided the responsibilities for census planning and operations between the Commonwealth of Puerto Rico and the Census Bureau.

³ A nonvoting delegate is an elected delegate who may not vote on the floor of the House of Representatives, but may vote on legislation as it is considered by committees to which the delegate has been named.

⁴ U.S. Census Bureau, *Geographic Areas Reference Manual*, 1994, pp. 7-19-7-22.

⁵ Swains Island, a coral atoll, was settled by an American in 1856, and his citizenship tied it to the United States. The island officially became part of American Samoa in 1925.

Census Bureau first included American Samoa in the decennial census in 1900; the local governor conducted a special census in 1912, and since 1920 American Samoa has been part of each decennial census.⁶

The Commonwealth of the Northern Mariana Islands (CNMI), which is part of Micronesia, comprises the former Mariana Islands District of the Trust Territory of the Pacific Islands (TTPI). It consists of three main islands—Saipan, Tinian, and Rota—and several small islands and atolls. The United States gained control of the Mariana Islands in military victories over Japan in 1944. In 1947, a trusteeship agreement between the United States and the United Nations placed the administrative authority of the islands under the U.S. Department of the Interior. The Northern Mariana Islands, however, given their strategic significance, remained under military control until 1961. Over several years, the entities within the TTPI worked toward self-government. In 1975, the United States and the Northern Mariana Islands concluded a covenant that resulted in that entity becoming a commonwealth of the United States. In 1978, the Northern Mariana Islands established a separate government. By 1986, a presidential proclamation dissolved the trusteeship agreement for all of the TTPI, and Palau and the CNMI attained commonwealth status.⁷ The CNMI was first included in the 1970 decennial census as part of the TTPI, but was treated separately in 1980 tabulations because the legal structure for its commonwealth status was in place.⁸

The U.S. Virgin Islands (USVI) is an organized, unincorporated territory of the United States. The USVI comprises over 50 separate islands and cays, the population of which is distributed between three main islands—St. Croix, St. Thomas, and St. John. In 1917, the United States purchased these islands from Denmark. They remained under the jurisdiction of the U.S. Department of the Navy until 1931, when an executive order placed them under the Department of the Interior. Virgin Islanders were granted U.S. citizenship in 1917. Since 1970 they have elected their own governor, lieutenant governor, and legislature. In 1973, the USVI gained representation in the U.S. House of Representatives by a nonvoting delegate. Although the Census Bureau conducted a special census of the USVI in 1917, Virgin Islanders were not included in the decennial census until 1930.⁹

Other minor outlying areas are also included in the decennial census. The Census Bureau consulted with the Office of the Geographer and Global Issues, U.S. Department of State, as to which areas should be included in Census 2000. In 1990, the Census Bureau collected administrative counts for Midway Islands; Wake Island; Johnston Atoll; Navassa Island; Baker, Howland, and Jarvis Islands; Kingman Reef; and Palmyra Atoll. The Office of the Geographer agreed that these islands should be included in Census 2000. These islands are either uninhabited, occupied by the military, or periodically manned as research stations; access by civilians is restricted. The Population Division of the Census Bureau obtained population counts from the U.S. Departments of Defense, Interior, and Transportation in June 2000. These counts are included in tabulations that show totals for the United States, individual states, territories, and possessions.

The Republic of Palau, which had been enumerated by the Census Bureau in 1990, became an independent state in October 1994, so it was not included in Census 2000.¹⁰

Organization of Puerto Rico and Island Areas Branch

For Puerto Rico and the Island Areas, the Census Bureau's Puerto Rico and Island Areas (PRIA) Branch of the Decennial Management Division (DMD) worked with the PRPB and the Island Areas

⁶ U.S. Census Bureau, *Geographic Areas Reference Manual*, 1994, pp. 7-13–7-19.

⁷ Though included in the 1990 census, Palau became a Freely Associated State under a Compact of Free Association with the United States on October 1, 1994. Since it is no longer under the geographic scope of the census as defined in Title 13, Palau was not included in Census 2000. U.S. Census Bureau, "Program Master Plan: Census 2000 Island Areas," Census 2000 Informational Memorandum No. 109, March 2001, p. 3.

⁸ The Department of the Interior, the Department of the Navy, and the Japanese government conducted periodic censuses before 1970.

⁹ U.S. Census Bureau, *Geographic Areas Reference Manual*, 1994, pp. 7-37–7-41.

¹⁰ See Martha Farnsworth Riche, U.S. Census Bureau, Washington, DC, to William Wood, Office of the Geographer and Global Issues, Department of State, Washington, DC, January 24, 1995; and William B. Wood, Office of the Geographer and Global Issues, Department of State, Washington, DC, to Martha Farnsworth Riche, U.S. Census Bureau, Washington, DC, March 6, 1995.

(IAs) governments, other Census Bureau divisions, and contractors to plan and coordinate Census 2000 activities. The PRIA Branch consisted of three sections—Puerto Rico, Island Areas, and Translation. The branch’s responsibilities included:

- Developing budgets and cost models.
- Drafting and negotiating the terms of each memorandum of agreement (MOA) for IAs and Puerto Rico, and ensuring all approvals and signatures were in place.
- Adapting geographic areas criteria.
- Preparing field and office procedures, manuals, and training guides.
- Preparing and purchasing outreach and promotional material.
- Developing an Island Areas Control System (IACS) to track progress at the local census office (LCO) level.
- Authorizing the disbursement of MOA funds to each area (IAs only).
- Maintaining communication with local government officials during planning, conduct, processing, and publication stages of the census.
- Ensuring closeout of LCOs and preparation of final accounting statements from each area (IAs only).

PUERTO RICO

Introduction

From 1960 to 1990, Puerto Rico was enumerated using the list/enumerate (L/E) methodology. However, in its planning for Census 2000, the Census Bureau decided to implement a mailback census methodology. An increase in the number of limited-access communities on the island, as well as a prevalence of two-income households prompted the Census Bureau to conduct Census 2000 using the update/leave (U/L) methodology.¹¹ In 1996, representatives from the Census Bureau’s Decennial Management Division, Population Division, Decennial Statistical Studies Division (DSSD), Geography Division (GEO), and Field Division formed the Puerto Rico 2000 Working Group. Responsible for the overall planning of census activities for Puerto Rico, this group also provided support to other divisions for specific operations in Puerto Rico.¹² To conduct Census 2000 in Puerto Rico, the Census Bureau established nine local census offices (LCOs), an Accuracy and Coverage Evaluation regional office, and an area office on the island. Responsible for the enumeration of 6,225 assignment areas, these LCOs operated under the same administrative infrastructure as stateside update/leave LCOs.¹³

Geography

The Census Bureau treats the Commonwealth of Puerto Rico as the statistical equivalent of a state. The commonwealth is divided into 78 first-order subdivisions. In Puerto Rico, the primary legal subdivisions are called “municipios.” These represent the highest-level legal subdivisions of Puerto Rico, similar to a county in most states (See Figure 12-1).¹⁴

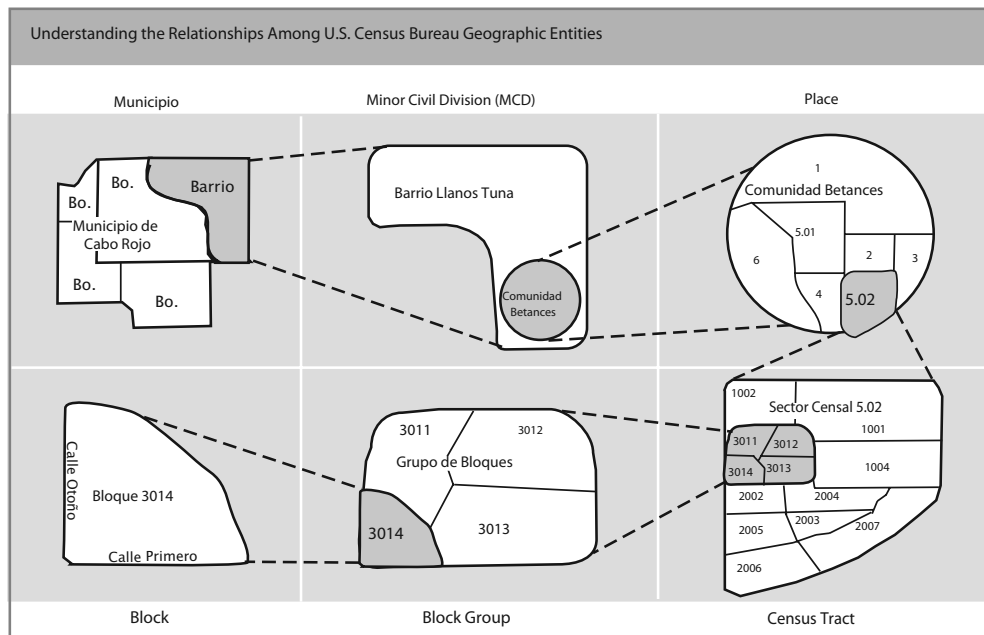
¹¹ U.S. Census Bureau, “Recommendation that the Census Bureau Use the Update/Leave Methodology for Data Collection During the Year 2000 Census of Puerto Rico,” Census 2000 Decision Memorandum No. 6, August 12, 1996; Tracey McNally, “Operational Analysis of Enumeration in Puerto Rico, Final Report,” Census 2000 Evaluation No. H.8., May 15, 2003. For more information on data collection methodologies, see Chapter 5, “Data Collection.”

¹² Julie Buckley-Ess and Idabelle Hovland, *Puerto Rico, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 14*, TR-14 (Washington, DC: U.S. Census Bureau, February 2004) p. 9; U.S. Census Bureau, Decennial Payroll/Personnel Staff, Field Division, “2000 Census Organization Structure and Staffing,” April 2001, p. 3.

¹³ For more information on the organization and administration of LCOs, see Chapter 5, “Data Collection.”

¹⁴ There are 78 municipios in Puerto Rico.

Figure 12-1.
Census Small-Area Geography, Puerto Rico



For Census 2000, the municipios were divided further into minor civil divisions (MCDs). MCDs are legally defined entities that subdivide the first-order subdivisions. For Puerto Rico, the Census Bureau recognizes barrios and barrios-pueblo as the primary legal divisions of municipios. One barrio in each municipio (except Florida, Ponce, and San Juan) is identified as the barrio-pueblo, the area that represented the seat of government at the time the commonwealth formalized the municipio and barrio boundaries in the late 1940s. Some barrios and barrios-pueblo in 23 municipios have been further subdivided into subbarrios that the Census Bureau treats as sub-MCDs.

Within MCDs are population centers without legally defined corporate limits or powers. Such entities are called census designated places (CDPs). CDPs are delineated by local officials in cooperation with the Census Bureau. Although in 1990 the Census Bureau required a CDP to have a population of at least 1,000 persons, for Census 2000 there was no minimum population threshold for CDPs. Since there are no incorporated places in Puerto Rico, the Census Bureau provides data for two types of CDPs there: zonas urbanas, which represent the governmental center of each municipio, and comunidades, which represent other settlements.¹⁵

Each geographic subdivision is further divided into census tracts (also called block numbering areas in 1990), which consist of block groups and blocks. In Puerto Rico, census tracts are small, statistical subdivisions of municipios. Typically averaging 4,000 persons, census tracts generally have stable boundaries and, when first established, were designed to have relatively homogeneous demographic characteristics. Census tracts are further divided into block groups (BGs). BGs are a collection of census blocks within a census tract sharing the same first digit of their four-digit identifying numbers. A block, the smallest geographic unit for which the Census Bureau tabulates data, is generally bounded by streets, legal boundaries, and other features.

¹⁵ Places for the reporting of decennial census data include CDPs, consolidated cities, and incorporated places. U.S. Census Bureau, *Summary Social, Economic, and Housing Characteristics*, PHC-2-A, "Appendix A: Census 2000 Geographic Terms and Concepts," pp. A-17–A-18, <<http://www.census.gov/geo/www/tiger/glossry2.pdf>>, (accessed April 17, 2006).

Questionnaire Content

From 1960 to 1990, the Census Bureau worked with the Puerto Rico Planning Board (PRPB) to develop questionnaire content that met Puerto Rico's needs. In 1990, the Puerto Rico questionnaire included topics on parents' places of birth, vocational training, and condition of housing units, but it did not include stateside topics such as race, Hispanic origin, and home heating fuel. For Census 2000, however, the government of Puerto Rico requested the same decennial questionnaire content as stateside. The value of quicker processing and release of Puerto Rico census data, the inclusion of Puerto Rico in stateside summary statistics, and the comparability with stateside data were cited as justification for the change.¹⁶ In November 1998, the Census Bureau decided to include data from Puerto Rico in the national summary data products and use the stateside questionnaire content for Census 2000.¹⁷

This departure from past practices provided greater comparability with stateside data. Questions about race and interpretations of racial identity, however, presented some difficulties. Residents of Puerto Rico overwhelmingly identified themselves as Hispanic (98.8 percent). About 95.1 percent of these identified themselves as Puerto Rican, 1.5 percent as Dominican, and less than 1.0 percent as either Cuban or Mexican.¹⁸

Although residents found Hispanic origin a concept with which they could easily identify, an evaluation using focus groups noted that the race question was confusing and inappropriate to the Puerto Rican context, where the concept of race is interpreted somewhat differently. There, the concept of the Puerto Rican "race" is viewed as a unique mixture of Spanish, Indian, and African, not identifiable using simply color or phenotypic characteristics. The notion of a Puerto Rican race appears to have prompted many respondents to report themselves as a single race, despite the fact that the questionnaire allowed for multiple races.¹⁹ Of those Puerto Ricans who identified themselves as Hispanic, 80.7 percent identified themselves as White alone, while 7.9 percent identified themselves as Black alone, and under 7.0 percent reported themselves as Some Other Race.²⁰

Marketing and Promotion

An important part of the strategy for Census 2000 involved the use of paid advertising to inform the public and promote participation in Census 2000. In Puerto Rico, the Census Bureau implemented marketing and promotion programs similar to those used stateside and worked to tailor the messages to address the concerns of the local population.²¹

The Census Bureau contracted with Young & Rubicam Puerto Rico, a subsidiary of Young & Rubicam, to develop and implement the paid advertising campaign for Puerto Rico. While the campaign conveyed messages similar to those used stateside, creative concepts and Spanish translations were tailored for the Puerto Rico context.²² An evaluation of this campaign indicated that Census 2000 promotion efforts were not favorably received by all Puerto Ricans. According to focus group participants, Puerto Ricans often perceived the advertising campaign messages as emphasizing only two things: (1) returning the questionnaire and (2) the role of the census in

¹⁶ Julie Buckley-Ess and Idabelle Hovland, *Puerto Rico, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 14, TR-14* (Washington, DC: U.S. Census Bureau, 2004), p. 3. This request was outlined in a letter from Norma Burgos, PRPB, to Martha Farnsworth Riche, U.S. Census Bureau, October 31, 1997.

¹⁷ Carol Van Horn to John H. Thompson, "Decision to Include Data from Puerto Rico in the National Summary Data Products for Census 2000," Census 2000 Decision Memorandum No. 64, November 24, 1998. See appendix for Puerto Rico questionnaires.

¹⁸ Julie Buckley-Ess and Idabelle Hovland, *Puerto Rico, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 14, TR-14* (Washington, D.C.: U.S. Census Bureau, 2004), pp. 13–16.

¹⁹ Susan Berkowitz, "Puerto Rico Focus Groups on the Census 2000 Race and Ethnicity Questions," Census 2000 Evaluation No. B.13., July 2001. The results of this study derive from focus groups carried out with 86 individuals (57 women and 29 men) in 12 selected sites across Puerto Rico.

²⁰ Matthew Christenson, "Puerto Rico Census 2000 Responses to the Race and Ethnicity Questions," Census 2000 Evaluation No. B.12., July 2003.

²¹ See Chapter 4, "The Partnership and Marketing Program" for more information on partnership and promotion activities for Census 2000.

²² Kenneth Meyer, "Draft Decision Memo for Dr. Prewitt," undated, and correspondence between Young & Rubicam Inc. and U.S. Census Bureau, June 14, 1999.

determining federal aid. Focus group participants felt that the census advertising campaign did not convey a broad sense of purpose and was reminiscent of a political campaign. This, according to the evaluation, combined with a more impersonal enumeration methodology, prompted suspicion of some census activities and negatively influenced response rates.²³

Address List Development

In 1990, as in earlier censuses, the Census Bureau enumerated Puerto Rico using the list/ enumerate (L/E) methodology. During the week before Census Day, the U.S. Postal Service (USPS) delivered unaddressed, short-form Advance Census Reports (ACRs) to all residences. Beginning on Census Day, L/E enumerators canvassed their assignment areas, retrieving completed ACRs and recording address information for all housing units. If a household had not completed the ACR, the enumerator used an enumerator-friendly questionnaire (EFQ) to enumerate the household. If the household was designated for a long-form questionnaire, the enumerator asked the long-form questions and noted the answers, as well as transcribed the data from the household's ACR, onto an EFQ. All of the stateside L/E operations, such as merge and sample tolerance checks, were also performed for Puerto Rico.²⁴

For Census 2000, the Census Bureau replaced the L/E methodology with the update/leave (U/L) methodology. The decision to use this methodology required that housing units be listed in a pre-census operation called address listing. The Puerto Rico 2000 Working Group supported the move from L/E methodology to U/L methodology, but was concerned that using a procedure designed for rural enumeration in an urban setting could lead to problems both in the collection and processing routines. Equally daunting were the problems inherent in creating the address list for the island.

The address listing operation began with a thorough canvass of the island. Addresses were collected using a Puerto Rico address register that included an extra line for collecting urbanization or condominium name. An address listing canvasser noted the location of each housing unit on a map and assigned a "map spot" number for each. The canvasser then recorded the map spot number in the address register. Canvassers also updated the maps to show new or altered features, including buildings, roads, and bridges.

Local Update of Census Addresses 1999 program (LUCA 99) and update/leave (U/L).

LUCA 99 invited local governments to participate in the review of addresses collected during the address listing operation. In Puerto Rico, 50 of the 78 municipios participated and provided an additional 35,563 addresses. These addresses were sent out for field verification, and of these, 33,029 addresses were verified; 2,513 were deleted; 21 were determined to be nonresidential, and none needed to be corrected. Enumerators added a total of 9,874 additional addresses in recanvassed areas.²⁵

During the LUCA 99 U/L operation, an enumerator delivered a questionnaire with a preprinted address label to every housing unit on the enumerator's address list. Existing units not listed on the address register received hand-addressed questionnaires and were added to the enumerator's address register. The respondent was instructed to fill out the questionnaire and mail it back using the envelope provided. While in the field delivering the questionnaires, staff also made corrections, deletions, and additions to the address lists and maps.

Differences in addressing conventions and the use of Spanish forms created challenges for the stateside processing systems. For each living quarters in Puerto Rico, the address register

²³ Susan Berkowitz, "Puerto Rico Focus Groups on Why Households Did Not Mail Back the Census 2000 Questionnaires," Census 2000 Evaluation No. A.8., July 2001, pp. 15–16.

²⁴ Tracey McNally, "Operational Analysis of Enumeration in Puerto Rico, Final Report," Census 2000 Evaluation No. H.8., May 15, 2003, p. 2.

²⁵ Julie Buckley-Ess and Idabelle Hovland, *Puerto Rico, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 14, TR-14* (Washington, DC: U.S. Census Bureau, 2004), p. 8; Karen L. Owens, "Evaluation of the Local Update of Census Addresses 99 (LUCA 99)," Census 2000 Evaluation No. F.6., May 2002.

required a four-line address rather than the three-line stateside address format. The fourth line indicated the urbanization or condominium name necessary for Puerto Rico addresses to have a unique ZIP+4 address.²⁶

Address list processing. The Census Bureau's Decennial Systems and Contracts Management Office (DSCMO) had problems processing the address listing pages for Puerto Rico that were keyed in. Like stateside files, the keyed files included a 60-character address field that could contain a city-style address or location description. Stateside files had a flag, "A/D," set by the lister. "A" indicated a city-style address and "D" a location description. In Puerto Rico, the address listing pages were in Spanish and the flag was "D/L." "D" stood for *dirección* and indicated a city-style address. "L" stood for *localización* and indicated a physical location description. DSCMO read the "D" on the Puerto Rico address files as indicating a location description, as "D" did in the United States. When DSCMO reprocessed the files in an attempt to correct the error, unexpected address configurations arose that rendered the address information useless for the stateside standardizer. As a result, DSCMO and the Geography Division (GEO) could not get the correct information in the appropriate city-style address and location description fields on a master address file (MAF) that was specifically designed for stateside addressing conventions. GEO and DSCMO decided to load the entire address field (city-style and location description) in the location description field on the MAF. This decision allowed field enumeration operations to continue, but compromised Puerto Rico address listing data.

Address list postprocessing. In April 2000, in an attempt to clean up the Puerto Rico MAF, GEO entered into a contract with a private firm, Seek Data, to create a revised MAF record layout. The revised MAF record layout included additional address fields and split the address information collected during census field operations into component parts. Seek Data added approximately 64,000 new housing units to the MAF and geocoded each address to a municipio, tract, and block. Working with customer files of the USPS in Puerto Rico, the company attempted to match the MAF with information on new housing units that came from the USPS delivery sequence file.²⁷

Data Collection

In 1996, the Census Bureau decided to use the U/L methodology to conduct Census 2000, marking a departure from previous censuses, which relied upon the L/E methodology. Based upon the 1990 census results, the agency recognized that large parts of Puerto Rico were sufficiently urbanized to make a mail methodology feasible for the census. The Census Bureau decided to use the U/L enumeration method that it determined to be well-suited to Puerto Rico. A single enumeration methodology provided cost savings and simpler reporting and monitoring requirements.²⁸

To conduct U/L, census field offices (CFOs) first conducted a precensus operation called address listing (see "Address List Development" in this chapter). The Census Bureau's National Processing Center (NPC) keyed these address listing pages, which became the address list used for U/L. LCOs grouped these addresses into assignment areas and put them into address registers. Questionnaire delivery began on March 3, 2000, with the intent that all questionnaires would be delivered by Census Day. However, the operation was not complete until April 6. During the U/L operation, an enumerator delivered a questionnaire with a preprinted address label to every housing unit on

²⁶ "Urbanization" is used here to indicate an area, sector, or development within a geographic area. In addition to being a descriptive word, it precedes the name of the area. This descriptor, commonly used in Puerto Rican urban areas, is an important part of the addressing format of Puerto Rico, as it describes the location of a given street. Megan C. Ruhnke, "The Address Listing Operation and Its Impact on the Master Address File, Final Report," Census 2000 Evaluation No. F.2., January 30, 2002, p. 8; pp. 7–10.

²⁷ The contract between Seek Data and the Census Bureau expired in December 2004 at a total cost of about \$5 million. These addresses were added following Census 2000 to prepare the Puerto Rico MAF for the Puerto Rico Community Survey. U.S. Census Bureau, American Community Survey Office, team leaders meeting minutes, January 10, 2006, <<http://cwww.acs.census.gov/ACS%20Office/Leaders/2006/tldr011006.pdf>>, (accessed May 15, 2006).

²⁸ John H. Thompson, "Recommendation That the Census Bureau Use the Update/Leave Methodology for Data Collection During the Year 2000 Census of Puerto Rico," Census 2000 Decision Memorandum No. 6, signed by Robert W. Marx, August 12, 1996; Tracey McNally, "Operational Analysis of Enumeration in Puerto Rico, Final Report," Census 2000 Evaluation No. H.8., May 15, 2003, pp. 2–3.

the enumerator's address list. An existing unit not listed on the address register received a hand-addressed questionnaire and was added to the address register. The respondent was instructed to fill out the questionnaire and mail it back using the envelope provided.

The workload for U/L in Puerto Rico included 1.5 million addresses. While in the field delivering the questionnaires, staff also made corrections, deletions, and additions on the address lists and maps. "Deletes" of addresses determined to be nonexistent or nonresidential accounted for 8.4 percent of the Puerto Rico workload, while "adds" accounted for 7.6 percent. Of the 111,787 adds, 93,607 were included in the final census counts. By the cutoff for nonresponse follow-up on April 18, 2000, the response rate for Puerto Rico was 48.4 percent. The final return rate (as of December 31, 2000) for Puerto Rico was 64.0 percent. Although somewhat lower than the state-side response and return rates—59.3 percent and 77.9 percent, respectively—these rates indicated a reasonable level of participation for Puerto Rico's first census for which respondents were required to return questionnaires by mail.²⁹

Enumeration in Puerto Rico followed the same schedule as the stateside U/L and nonresponse follow-up (NRFU) operations. Housing units that did not return completed questionnaires by the cutoff date were assigned for NRFU. After NRFU, LCOs conducted a coverage improvement follow-up (CIFU) operation similar to the one used stateside.³⁰ The NRFU operation added 28,793 addresses and deleted 78,680.³¹

The LCOs encountered some operational difficulties during NRFU. Many addresses from which questionnaires had been mailed back were not recorded in the system. These addresses became part of the NRFU workload, resulting in enumerators making several unnecessary visits to housing units. Moreover, insufficient time for processing and printing map updates between U/L and NRFU meant that maps used by NRFU and CIFU enumerators had not been updated for these operations.³²

Quality Assurance

For the U/L operation in Puerto Rico, the Census Bureau used the same quality assurance (QA) procedures as stateside. This program was designed to assure that errors did not disproportionately affect specific communities. QA in Puerto Rico focused on three objectives:

- To prevent errors caused by lack of understanding on the part of the enumerator.
- To identify and correct significant coverage and content errors.
- To improve enumerator performance throughout the operation by providing performance information.

To accomplish the first objective, a crew leader or crew leader assistant conducted an initial review of the enumerator, covering ten housing units and/or special places, during the enumerator's first week on the job. LCOs achieved the second objective by identifying and correcting assignment areas with unacceptable levels of errors in a dependent review. Lastly, to accomplish the third objective, crew leaders provided enumerators with structured feedback regarding performance.³³

²⁹ Tracey McNally, "Operational Analysis of Enumeration in Puerto Rico, Final Report," Census 2000 Evaluation No. H.8., May 15, 2003, p. 1.

³⁰ For general information on U/L, NRFU, CIFU, and group quarters data collection operations, see Chapter 5, "Data Collection."

³¹ Tracey McNally, "Operational Analysis of Enumeration in Puerto Rico, Final Report," Census 2000 Evaluation No. H.8., May 15, 2003, p. 1.

³² Tracey McNally, "Operational Analysis of Enumeration in Puerto Rico, Final Report," Census 2000 Evaluation No. H.8., May 15, 2003. For more information on data collection activities stateside and in Puerto Rico, see also Darlene A. Moul, "Nonresponse Followup for Census 2000," Census 2000 Evaluation No. H.5., July 2002; Kimball Jonas, "Group Quarters Enumeration," Census 2000 Evaluation No. E.5., August 2003; and Julie Buckley-Ess and Idabelle Hovland, *Puerto Rico, Census 2000 Testing, Experimentation, and Evaluation Program Topic Report No. 14, TR-14* (Washington, DC: U.S. Census Bureau, 2004).

³³ Howard Hogan to Brian Monaghan, "Specifications for the Quality Assurance for Update/Leave," DSSD Census 2000 Procedures and Operations Memorandum Series No. N-1, undated, pp. 1–13.

Data Processing

Puerto Rico mail returns followed the same processing workflow as stateside U/L returns.³⁴ LCOs sent all Puerto Rico U/L and NRFU forms to the data capture center in Pomona, CA, for data capture. A U/L “add form”—unlike a standard U/L form—contained a handwritten address field in the form’s labeled area, next to a preprinted processing ID. An add form required wanding the bar-code and keying the address information.³⁵ Puerto Rico LCOs sent Be Counted forms and all group quarters enumeration forms to the NPC for data capture.

Data Products

For Census 2000, the Census Bureau used a variety of media and technologies to disseminate data to users. The primary method of dissemination employed a data retrieval system called American FactFinder (AFF).³⁶ AFF provided an interactive electronic system that enabled users to access data products, data documentation, and online help, as well as build custom data products on- and offline. First available in January 1999, AFF was updated with additional functions and data files by April 1999. By March 2001, AFF provided users with access to Census 2000 data products. In addition to AFF, the Census Bureau published data products using digital media, including CD-ROMs, DVDs, and portable document files of printed reports available on the Internet.

The Census Bureau published detailed results of Census 2000 for Puerto Rico in a series of files accessible through AFF on the Internet, as well as in printed reports available through the Government Printing Office (GPO).

- **Census 2000 Puerto Rico Redistricting Summary File**

Released on March 30, 2001, this was the first Census 2000 data file released for Puerto Rico. It provided information required for local redistricting. The data included tabulations of 63 race categories, cross-tabulated by Hispanic or Latino and not Hispanic or Latino for the total population and the population 18 years old and over. These tabulations were presented for areas as small as blocks, census tracts, and voting districts. They were available on the Internet (through American FactFinder) and on CD-ROM.

- **Summary File 1 (SF 1)**

SF 1 presented counts and basic cross-tabulations of information collected from all people and housing units (100 percent items). The file provided population counts for 63 race categories and Hispanic and Latino at the block level and was available on August 1, 2001. It also included population counts for detailed race and ethnicity categories at the census tract level. SF 1 also provided selected population and housing characteristics for both blocks and census tracts. In 2003, the Census Bureau also released a supplement to SF 1 that included population and housing counts for urban and rural areas.

- **Summary File 2 (SF 2)**

Released on March 27, 2002, this file also contained 100 percent population and housing characteristics iterated for a selected list of detailed race and Hispanic or Latino origin groups as well as American Indian and Alaska Native tribes. The lowest level of geography for this file was the census tract, with a population-size threshold required for information to be shown for a particular group. This file also included quick tables and geographic comparison tables.

³⁴ See Chapter 6, “Data Capture and Processing” for information on data capture and headquarters processing. See also U.S. Census Bureau, “Program Master Plan for the Update/Leave Operation,” Census 2000 Informational Memorandum No. 89, December 7, 2000, p. 31.

³⁵ U.S. Census Bureau, “Program Master Plan: Data Capture Systems and Operations,” Census 2000 Informational Memorandum No. 107, March 30, 2001, p. 39.

³⁶ During its development, AFF was known as the data access and dissemination system (DADS). See Chapter 9, “Data Products and Dissemination,” for more information on Census 2000 data products.

- **Summary File 3 (SF 3)**

Released on September 4, 2002, SF 3 contained information collected on a sample basis. It included data on income, educational attainment, poverty status, home value, and population totals for foreign-born and ancestry groups. Data were provided down to the block-group level for many tabulations, but only to the census-tract level for others. SF 3 also included data by Zip Code tabulation areas (ZCTAs). This file was available to users on the Internet (through AFF) and on CD-ROM and DVD.

- **Summary File 4 (SF 4)**

SF 4, which included tabulations of population and housing data collected from a sample of the population, was released on May 7, 2003. Just as in SF 2, the tables in SF 4 were iterated for a selected list of race and Hispanic or Latino origin groups and for American Indian and Alaska Native tribes. Tables were also iterated for 86 ancestry groups. This file was available on the Internet (through AFF) and on CD-ROM and DVD. AFF also offered various quick tables and geographic comparison tables derived from SF 4.

- **Microdata**

In addition to these files, the Census Bureau provided users with public use microdata sample (PUMS) files. The PUMS files allowed users to prepare their own tabulations and cross tabulations of most population and housing subjects. The PUMS files contained the actual responses to census questionnaires, with names and addresses removed and the geography sufficiently broad to protect confidentiality. The Census Bureau published two PUMS files on CD-ROM for Puerto Rico. On May 7, 2003, the Census Bureau released a 1 percent sample PUMS file, and on August 27, 2003, released a 5 percent sample PUMS file.

For the first time, the national summary volumes included Census 2000 data for Puerto Rico. The agency also published three state-level reports containing data for Puerto Rico available in both English and Spanish:

- ***Summary Population and Housing Characteristics (PHC-1)***

PHC-1 contained information collected on a 100 percent basis. It presented information for Puerto Rico municipios, places, and other areas. It was released on November 29, 2002, on the Internet and through GPO in printed form.

- ***Summary Social, Economic, and Housing Characteristics (PHC-2)***

This report contained information on the sample population and housing subjects for Puerto Rico municipios, places, and other areas. It was released on July 22, 2003, on the Internet and in printed form.

- ***Population and Housing Unit Counts (PHC-3)***

PHC-3 contained population and housing unit totals for Census 2000 as well as for the 1990 and 1980 censuses. It was released on November 13, 2003, on the Internet and through GPO in printed form.

ISLAND AREAS

Introduction

In the Island Areas (IAs), a memorandum of understanding provided the budget and logistics plan for the local census office (LCO) infrastructure and staffing. Responsibilities for Census 2000 operations in the IAs were divided among the Decennial Management Division (DMD), regional census centers (RCCs) which handled geographic programs, local IA governments, and the Census Bureau's National Processing Center (NPC). DMD provided guidance to the IAs regarding field office infrastructure and staffing. Working with IA liaisons, DMD provided assistance in the development of competitive pay rates, applicant tests, and background screening using the Decennial Automated Name Check system.³⁷

DMD also worked with its contractor, Booz Allen Hamilton, to develop a Windows-based Island Areas Control System (called IACS) to manage and monitor operations in the IA LCOs. The IACS provided an employee subsystem to track employee hours and tasks and a questionnaire subsystem designed to allow LCO clerks to enter information from questionnaires and address listing pages that were checked into the LCO.³⁸

DMD developed and distributed field and office forms, procedures, training materials, and other equipment and supplies. DMD also monitored all census operations with the help of census advisors assigned to each IA. Since 1980, the Census Bureau has appointed Census Bureau employees to serve as census advisors in each of the enumerated IAs. These employees act as liaisons between the agency and the LCOs. Census advisors performed the following functions:

- Administered the oath of office to the census manager and other office staff.
- Trained the assistant managers and assisted with the training of field and office staff.
- Monitored costs.
- Provided guidance and technical support.
- Ensured census procedures were followed.

During Census 2000, DMD encountered some difficulties in supplying IA LCOs with materials. Late shipments of supply kits delayed the start of some operations, prompting census advisors to purchase necessary supplies locally. In the U.S. Virgin Islands (USVI), inadequate supplies of office furniture delayed hiring for positions. Lastly, IA LCOs often received insufficient quantities of forms and address registers. Each of these issues, however, was addressed and resolved by the Census Bureau's Puerto Rico and Island Areas (PRIA) Branch and by census advisors.³⁹

The Los Angeles RCC (for the Pacific IAs) and the Boston RCC (for the USVI) provided geographic support for data collection activities. RCC personnel conducted updates of the Census Bureau's Topologically Integrated Geographic Encoding and Referencing (TIGER®) database, produced enumerator maps, and reviewed and revised assignment area (AA) boundaries accordingly.

The Pacific island governments established an LCO in each area for the purpose of data collection. The government of the USVI established two LCOs, one in St. Thomas and one in St. Croix. These IA LCOs opened in December 1999. The IA governors, through the terms of the memorandum of agreement (MOA), selected the census manager for their areas. Census manager responsibilities included the following activities:⁴⁰

- Obtaining space, furniture, equipment, and supplies for LCOs.
- Managing field-staff payroll and personnel systems.

³⁷ Although DMD provided position descriptions, selection tests, and screening, matters of payroll and administration matters were the responsibility of the IA governments.

³⁸ Julie Buckley-Ess, "Assessment Report: Island Areas Enumeration," Census 2000 Informational Memorandum No. 133, February 11, 2003, pp. 26–27.

³⁹ *Ibid.*, p. 19.

⁴⁰ U.S. Census Bureau, "Program Master Plan: Census 2000 Island Areas," Census 2000 Informational Memorandum No. 109, March 2001, pp. 24–26.

The USVI established “census subdistricts” as the primary subdivisions of the islands for the reporting of decennial census data. Used by the Census Bureau since 1980, these 20 census subdistricts are legally established entities—MCD equivalents—intended to be permanent areas that reflect land-use planning districts.

Within MCDs are population centers without legally defined corporate limits or powers. Such entities are called census designated places (CDPs). CDPs are delineated by local officials in cooperation with the Census Bureau. Although in 1990 the Census Bureau required a CDP to have a population of at least 1,000 persons, for Census 2000 there was no minimum population threshold for CDPs. In American Samoa there are no CDPs. Instead, the Census Bureau treats the traditional villages as statistically equivalent to incorporated places. In the CNMI and Guam, all places are CDPs. The USVI has both CDPs and incorporated places.⁴¹

Each geographic subdivision is further divided into census tracts (called block numbering areas in 1990) which consist of block groups and blocks. Census tracts are small statistical subdivisions of counties or statistically equivalent areas. While in the USVI census tracts typically average 4,000 persons in size, in American Samoa, the CNMI, and Guam, the optimum size is 2,500 persons. Census tracts generally have stable boundaries, and when first established, they were designed to have relatively homogeneous demographic characteristics. Census tracts are further divided into block groups (BGs). BGs are a collection of census blocks within a census tract sharing the same first digit of their four-digit identifying numbers. Generally bounded by streets, legal boundaries, and other features, a block is the smallest geographic unit for which the Census Bureau tabulates data.

Questionnaire Content

The Population Division (POP) and Housing and Household Economic Statistics Division (HHES) worked in consultation with the IA governments to develop questionnaire content that met the specific legislative and programmatic requirements of each IA. The IA section of the PRIA Branch coordinated communication between the subject-matter divisions and each area.

To determine the content for IA questionnaires, the Census Bureau first assessed the requirements of census data for both the federal and nonfederal sectors by requesting federal agencies to identify all legal mandates and programs requiring census data and by conducting a survey of nonfederal data users and their subject needs. In July 1996, DMD requested that each IA government organize an interagency committee (IC) to make recommendations on content and other issues. The ICs submitted their subject recommendations in late 1996 and early 1997. Subsequently, Census Bureau subject-matter divisions used these recommendations to prepare lists of subjects for inclusion. The content of the IA questionnaires was comparable to the stateside questionnaire, but with modifications based on recommendations from the IA. The Content Council, a Census Bureau interdivisional group at Census Bureau headquarters, reviewed and approved the list of subjects for the IAs. In October 1997, DMD forwarded the subject list to IA governments for review and concurrence.

POP and HHES used stateside questions and the subject recommendations to develop the specific wording of questions for the IAs. In July 1998, area ICs reviewed and commented on these draft questions. After POP and HHES made appropriate revisions based on IC input, the questionnaires were submitted to the U.S. Office of Management and Budget for clearance in January 1999.⁴²

Questionnaires in the IAs incorporated the user-friendly features of stateside forms. These included large, easy-to-read fonts, instructions located on the form rather than in a separate guide, and navigational aids and graphics to direct respondents. Additionally, each area had its

⁴¹ Places, for the reporting of decennial census data, include CDPs, consolidated cities, and incorporated places. U.S. Census Bureau, *Summary Social, Economic, and Housing Characteristics*, PHC-2-A, “Appendix A: Census 2000 Geographic Terms and Concepts,” pp. A-17–A-18 <<http://www.census.gov/geo/www/tiger/glossry2.pdf>>, (accessed April 17, 2006).

⁴² U.S. Census Bureau, “Program Master Plan: Census 2000 Island Areas,” Census 2000 Informational Memorandum No. 109, March 2001, pp. 12–16. As in previous IA censuses, there was no sampling for content.

own logo printed on the questionnaires and forms. The questionnaires used in American Samoa, the CNMI, and Guam contained 27 questions relating to housing characteristics and 37 questions relating to population characteristics. The USVI questionnaire included 24 housing questions and 36 population questions. (See Tables 12-1 and 12-2 for lists of subjects covered on the questionnaires.)⁴³

Table 12-1.

Information Available From the Census of Population and Housing: Pacific Island Areas⁴⁴

Basic Subjects

Age
Household relationship
Race/ethnicity

Sex
Tenure
Vacancy characteristics

Detailed Subjects

Population

Disability
Fertility, including date of birth of last child
Frequency of English usage
Grandparents as caregivers
Income in 1999
Labor force status
Language spoken at home
Marital status
Migration (residence in 1995)
Military dependency
Occupation, industry, and class of worker
Parental birthplace
Place of birth, citizenship, and year of entry to Pacific Island Area
Place of work and journey to work
Reason for migration
School enrollment and educational attainment
Veteran status
Vocational training
Work status in 1999

Housing

Air conditioning
Battery operated radio
Business/medical office on property
Condominium status
Materials used for walls/roof/foundation
Number of rooms and number of bedrooms
Plumbing and kitchen facilities
Sewage disposal
Source of water
Telephone service
Units in structure
Utilities, mortgage, taxes, insurance and fuel
Value of home or monthly rent paid
Vehicles available
Year moved into residence
Year structure built

⁴³ Julie Buckley-Ess, "Assessment Report: Island Areas Enumeration," Census 2000 Informational Memorandum No. 133, February 11, 2003, p. 7.

⁴⁴ U.S. Census Bureau, "Introduction to Census 2000 Data Products—Pacific Island Areas," DMD/01-ICDPPI, August 2001.

Table 12-2.

Information Available From the Census of Population and Housing: U.S. Virgin Islands⁴⁵

Basic Subjects

Age
Hispanic or Latino origin
Household relationship
Race

Sex
Tenure
Vacancy characteristics

Detailed Subjects

Population

Disability
Fertility
Grandparents as caregivers
Income in 1999
Labor force status
Language spoken at home and ability to speak English
Marital status
Migration (residence in 1995)
Occupation, industry, and class of worker
Parental birthplace
Place of birth, citizenship, and year of entry to the U.S. Virgin Islands
Place of work and journey to work
School enrollment and educational attainment
Veteran status
Vocational training
Work status in 1999

Housing

Condominium status
Cooking fuel
Farm residence
Number of rooms and number of bedrooms
Plumbing and kitchen facilities
Purchase of water from water vendor
Sewage disposal
Source of water
Telephone service
Units in structure
Utilities, mortgage, taxes, insurance and fuel costs
Value of home or monthly rent paid
Vehicles available
Year moved into residence
Year structure built

Census 2000 marked the first time an Advance Census Report (ACR) was used in the IAs. For these forms, the Census Bureau used a two-part mailing strategy. First was the blanket mailing of an advance notice letter to U.S. Postal Service residential customers alerting them that a census questionnaire would be arriving soon. The blanket mailing of the ACR questionnaire followed a few days later. Instructions called for the questionnaire to be completed and held until an enumerator came to pick it up. If the household did not complete the ACR, or did not receive it in the mail, enumerators conducted an interview at the household using the simplified enumerator questionnaire.

During Census 2000, the IA LCO staff encountered problems with the length of the questionnaire and the distribution of ACRs. First, although the use of the ACR often saved time and expense by eliminating the need for an interview, respondents still expressed frustration with the number of questions and felt that many of the questions, particularly those about income, were too personal. The distribution plan for the ACRs also excluded several IA residents who shared post office boxes with other households or user call boxes.

The Census Bureau adapted other types of forms to meet requirements of the IAs. These included Military Census Reports and Individual Census Reports used to enumerate people living in group quarters. The PRIA Branch also prepared Be Counted forms for those who believed they did not receive a questionnaire or were not included on a census form. Be Counted forms were placed at post offices and other community centers and were only available in English. Of the more than 53,000 Be Counted forms printed, however, only 108 were returned to the IA LCOs.⁴⁶

⁴⁵ U.S. Census Bureau, "Introduction to Census 2000 Data Products—U.S. Virgin Islands," DMD/01-ICDPVI, August 2001.

⁴⁶ Julie Buckley-Ess, "Assessment Report: Island Areas Enumeration," Census 2000 Informational Memorandum No. 133, February 11, 2003, pp. 7–11.

Marketing and Promotion

In the IAs, residents' perceptions of the U.S. government and knowledge of the census and its purpose varied considerably. While many approved of the federal government's role in the IAs, some expressed ambivalence. And, while some were aware of the census, few understood its significance to the IAs.⁴⁷ In an effort to address these issues, the Census Bureau's partnership specialists worked with census managers and advisors to develop partnerships with community organizations and local governments. These partnerships helped to inform IA residents about Census 2000 and promote its value to them. Such groups supported Census 2000 promotional activities in a variety of ways: issuing endorsements, holding press conferences and special events, placing census articles in newsletters, distributing promotional materials, and so forth. Local organizations also aided in recruiting candidates for census office and field positions.

DMD and the Census 2000 Publicity Office also worked with the IA liaisons and the Census Bureau's contractor, Young & Rubicam Miami, to design and implement a print and radio advertising campaign using local media outlets. Since it was produced in English only, the campaign had limited impact in the IAs, although it did provide a head start in creating awareness about the census. In an effort to promote the census in the IAs more effectively, an addendum to the original MOA provided additional funds for LCO partnership specialists to contract for locally produced television ads, flyers, and fact sheets.

In addition to the advertising campaign, the Census Bureau developed two other programs: (1) a program in which the Census Bureau invited local artists to develop promotional posters that touched upon local traditions and cultural themes to promote census awareness and (2) the Census in Schools Project, in which the Census Bureau promoted awareness of the census and its significance in classroom lesson plans and workshops.⁴⁸ Despite the uneven distribution of limited quantities of materials, both the promotional posters and Census in Schools projects succeeded in promoting awareness.⁴⁹

Data Collection

The LCO staff used the list/enumerate (L/E) methodology to conduct Census 2000 in the IAs. All persons and housing units were enumerated with a long-form questionnaire. This was the same methodology used in 1990. However, L/E was enhanced for Census 2000 through the use of an advance notice letter and the use of Advance Census Reports (ACRs). In March 2000, the USPS delivered unaddressed advance notice letters, followed by ACRs to all housing units. During the L/E operation, enumerators visited every housing unit and either collected the completed ACR or conducted a personal interview at the household. Enumerators also developed address lists for their assigned area and map spotted each living quarters' location.

The Census Bureau used special procedures to enumerate people not living in traditional housing units. Persons living in group quarters (GQ)—such as nursing homes, group homes, and dormitories—as well as persons living on military installations, were enumerated on either Individual Census Reports (ICRs) or Military Census Reports (MCRs). When each IA LCO opened, its staff updated its inventory of special places by identifying persons to contact for collecting administrative information for a location, assigning GQ type codes, and identifying housing units associated with special places. IA LCOs completed this update in March 2000.

Concurrently with the L/E operation, the IA LCO staff conducted GQ enumeration. During this operation, crew leaders and leader assistants listed all the residents at each GQ. They distributed ICRs or MCRs and answered questions when necessary.

⁴⁷ Penn, Schoen, and Berland Associates, "A Report on Census 2000 Advertising Concepts: South Pacific Focus Groups, American Samoa, Guam, Saipan," April 29, 1999, in "Census 2000 Qualitative and Quantitative Advertising Research, Volume 1 of 3."

⁴⁸ U.S. Census Bureau, "Program Master Plan: Census 2000 Island Areas," Census 2000 Informational Memorandum No. 109, March 2001, pp. 6–10. For more information on the Census in Schools Project, see Chapter 4, "The Partnership and Marketing Program."

⁴⁹ Julie Buckley-Ess, "Assessment Report: Island Areas Enumeration," Census 2000 Informational Memorandum No. 133, February 11, 2003, pp. 12–13.

On March 31, enumerators conducted Transient Night (called T-Night), an operation to count persons of a highly transient nature. T-Night enumerators visited and interviewed people occupying commercial or public recreational vehicle campgrounds or parks, racetracks, fairs and carnivals, and marinas. Every person enumerated during T-Night had the opportunity to report a usual residence elsewhere. During T-Night, the crew leader and crew leader assistant visited each assigned place, met with a contact person at the site, offered the Privacy Act Notice, answered questions, and verified information about the site. The crew leader or crew leader assistant then interviewed each person at the assigned location using the enumerator questionnaire.

The Census Bureau worked with the U.S. Department of Defense and the U.S. Coast Guard to identify housing units and group quarters on military bases and used the L/E methodology to enumerate them. All military personnel were enumerated with MCRs at their operating unit or work station. To ensure that persons were enumerated at their usual residence, the LCO then conducted a merge operation to separate MCRs by group quarters and housing units. The clerical merge operation ensured that military personnel residing in housing units were enumerated on a household questionnaire and that military personnel residing in group quarters were enumerated there.⁵⁰

In addition to the enumeration operations, IA LCOs carried out several reviews to ensure that questionnaires sent for processing were complete. After L/E concluded, IA LCOs conducted a vacant housing unit follow-up operation to verify the occupancy status reported by enumerators during the L/E operation. For this operation, enumerators revisited housing units listed as vacant during L/E to determine whether the housing units were truly vacant on Census Day. If a housing unit was incorrectly reported as vacant on Census Day, the enumerator conducted an interview and completed a questionnaire for the unit. If the housing unit was occupied but had been correctly listed as vacant on Census Day, the enumerator collected housing information from either the new occupant or a proxy respondent.

Following data collection activities, IA LCOs conducted a clerical edit to review questionnaires for completeness. IA LCO staff identified discrepancies between the number of persons reported and the number of persons for whom census information was provided. Clerical staff also reviewed questionnaires for missing or incomplete responses. IA LCO clerks telephoned the household that submitted a questionnaire that failed the edit to make needed corrections. LCO staff personally visited those households that could not be reached by telephone. Completed in July 2000, this telephone follow-up proved successful. Clerks were able to contact many housing units by phone, thereby decreasing the field follow-up workload and reducing costs.⁵¹

Census 2000 marked the first time questionnaire write-in entries were coded in the LCOs. After clerical edit, IA LCO staff batched questionnaires in groups of 100 for coding. Items included in the coding operation were ethnicity, race (for USVI only), language spoken at home, place of birth, place of work, migration, and industry and occupation.⁵²

A lack of computer-assisted coding delayed completion of the coding operation and final field operations, but IA LCO staff resolved coding questions using local knowledge of locations and other concepts unique to the IAs.⁵³

⁵⁰ U.S. Census Bureau, "Program Master Plan: Census 2000 Island Areas," Census 2000 Informational Memorandum No. 109, March 2001, pp. 29–30. For general information on military enumeration, see Chapter 5, "Data Collection."

⁵¹ Julie Buckley-Ess, "Assessment Report: Island Areas Enumeration," Census 2000 Informational Memorandum No. 133, February 11, 2003, pp. 23–25. For more information on quality assurance for IA field operations, see Howard Hogan to Susan Miskura, "Quality Assurance Specifications for the Census 2000 Island Areas List/Enumerate Operation," DSSD Census 2000 Procedures and Operations Memorandum Series #II-17, December 16, 1999.

⁵² The International Programs Center produced the coding materials and provided on-site training and oversight for the coding operation. For more information on quality assurance for clerical coding in the IAs, see Howard Hogan to Susan Miskura, "Quality Assurance Specifications for the Census 2000 Clerical Coding Operation for the Pacific Islands," DSSD Census 2000 Procedures and Operations Memorandum Series #JJ-7, November 22, 1999, and Howard Hogan to Susan Miskura, "Quality Assurance Specifications for the Census 2000 Island Areas List/Enumerate Operation," DSSD Census 2000 Procedures and Operations Memorandum Series #II-17, December 16, 1999.

⁵³ Julie Buckley-Ess, "Assessment Report: Island Areas Enumeration," Census 2000 Informational Memorandum No. 133, February 11, 2003, p. 24.

In an effort to avoid multiple responses from questionnaires used in L/E, special enumerations, and Be Counted, IA LCO clerks geocoded addresses and performed address matching to identify and remove duplicate responses. Clerks also verified that a questionnaire was present for every address listed on the address register. Once enumeration was complete, each IA conducted an address list review operation. Reviewers appointed by local governments received census listings—grouped by assignment area and block—showing the preliminary counts of housing units (both vacant and occupied) and group quarters population counts. When reviewers identified potential problems at the block level, they reviewed census maps and address listing pages and assisted LCO personnel in investigating reported problems and making necessary corrections.⁵⁴ After the clerical merge operation, questionnaires were shipped to the National Processing Center (NPC) in Jeffersonville, IN, for data capture.

Quality Assurance

In the Island Areas, Decennial Statistical Studies Division (DSSD) established a quality assurance program based on that used for stateside L/E operations. Its primary objectives were:

- To ensure essential information on questionnaires was completed.
- To identify and correct clusters of completed work with significant errors.
- To ensure accurate completion of geographic information in the address registers and on the maps.
- To eliminate falsified data.

To accomplish the first objective, LCO staff performed an edit of all completed questionnaires. LCOs then conducted a review of a sample of the housing units in the L/E area and decided on the acceptance or rejection of the completed work. To achieve the third objective, LCOs performed an office review of all address registers and maps. Lastly, to identify and correct instances of fabrication, LCOs conducted a sample-basis reinterview operation and when necessary, reworked assignment areas.⁵⁵

Data Processing

In December 1998, after reviewing the requirements, workloads, and resources for the IAs data capture program, DMD and the Decennial Systems and Contracts Management Office determined a “key from paper” (KFP) approach, rather than using the Data Capture System 2000, to be the most timely and cost effective solution to IA data capture.⁵⁶ After office operations were completed in September, IA LCOs shipped questionnaires to the NPC for keying. The NPC completed check-in of IA questionnaires in November 2000, and by March 2001, NPC completed data capture for the IAs.

Once keying was complete, NPC staff transmitted the data capture files to the Population Division’s International Programs Center (IPC) at Census Bureau headquarters. The IPC staff edited the data files and prepared the edited detail files for tabulation using an integrated microcomputer processing system (IMPS). Developed by the Census Bureau’s IPC to process the Pacific Island data for the 1990 Census, IMPS consisted of several software modules designed for entering, editing, tabulating, analyzing, and managing census data. The Census Bureau decided to use IMPS to process IA data so that the IAs were not competing for stateside processing resources.⁵⁷

⁵⁴ Ibid., p. 14.

⁵⁵ Howard Hogan to Susan Miskura, “Quality Assurance Specifications for the Census 2000 Island Areas List/Enumerate Operation,” DSSD Census 2000 Procedures and Operations Memorandum Series #II-17, December 16, 1999, pp. 1–13.

⁵⁶ Carol Van Horn to John Thompson, “Recommendation on Strategy for Processing the Island Areas’ Census 2000—REVISED,” Census 2000 Decision Memorandum No. 68, December 14, 1998.

⁵⁷ U.S. Census Bureau, “Program Master Plan: Census 2000 Island Areas,” Census 2000 Informational Memorandum No. 109, March 2001, pp. 36–37.

Data Products

Using the IMPS to tabulate Census 2000 data for the IAs, the Census Bureau published a variety of data products through American FactFinder (AFF) and traditional media. For each of the IAs, the agency published the following (see Table 12-3 for the release schedule of IA data products):

- **Demographic Profile**

The demographic profile provided a snapshot of the demographic, social, economic, and housing characteristics for each county equivalent and place. Demographic profiles for the IAs were published online through AFF, on CD-ROM, and as paper tables.

- **Summary Files**

Summary files for the IAs presented data for basic subjects at the block level and data for detailed subjects at the block group level and census tract level (see Tables 12-1 and 12-2 for IA subjects.) These files were made available through AFF and the Internet and on CD-ROM.

- ***Census 2000 Social, Economic, and Housing Characteristics (PHC-4)***

This published report included information on detailed population and housing characteristics to the place level and was made available for purchase through the Government Printing Office and as a portable document file (PDF) on the Census Bureau Internet.

- **Microdata (Guam and USVI)**

The Census Bureau also published microdata for Guam and the USVI. The two public use microdata sample (PUMS) files were released on April 30, 2003, and May 30, 2003, respectively. These PUMS files provide a 10 percent sample of the entire area and were available through AFF or on CD-ROM.

Table 12-3.
Island Area Data Products Release Schedule

Area	Data product	Release date
American Samoa	Demographic profile	2/19/2002
	Summary file	2/28/2003
	<i>Census 2000 Social, Economic, and Housing Characteristics Report (PHC-4)</i>	6/13/2003
CNMI	Demographic profile	2/20/2002
	Summary file	4/29/2003
	<i>Census 2000 Social, Economic, and Housing Characteristics Report (PHC-4)</i>	6/19/2003
Guam	Demographic profile	2/7/2002
	Summary file	12/20/2002
	Public use microdata sample file	4/30/2003
	<i>Census 2000 Social, Economic, and Housing Characteristics Report (PHC-4)</i>	5/27/2003
USVI	Demographic profile	2/25/2002
	Summary file	10/9/2002
	Public use microdata sample file	5/30/2003
	<i>Census 2000 Social, Economic, and Housing Characteristics Report (PHC-4)</i>	6/4/2003

Appendix F: Overview of Congressional Hearings on Census 2000 Issues Held by Oversight Committees and Subcommittees

Date and committee or subcommittee ¹	Topic	Department of Commerce/ Census Bureau witnesses	Other federal government witnesses ²
March 12, 1991	Fiscal year 1992 budget initiatives and Census 2000 planning	Dr. Michael R. Darby, Under Secretary for Economic Affairs; Dr. Barbara E. Bryant, Census Bureau Director	General Accounting Office (GAO) ³
June 15, 1991	Role of local governments in 1990 census and plans for Census 2000	Roland H. Moore, Associate Director for Field Operations; John E. Reeder, Los Angeles Regional Office Director	GAO
August 1, 1991	Major design alternatives for Census 2000	Director Bryant	Reps. Schumer (D-NY) and Rogers (R-KY); Dr. Daniel Melnick, National Science Foundation
October 29–30, 1991	Role of nongovernmental organizations in 1990 census and plans for Census 2000	Peter Bounpane, Assistant Director for Decennial Census	None
June 10, 1992	GAO report, “Decennial Census—1990 Results Show Need for Fundamental Reform”	None	GAO
June 26, 1992 Senate Subcommittee on Government Information and Regulation (of the Committee on Governmental Affairs)	Use of administrative records in Census 2000	Director Bryant	GAO
July 1, 1992	Results and implications of 1992 Simplified Questionnaire Test	Director Bryant	GAO
October 1, 1992	Questionnaire content	None	None
March 2, 1993	Progress of Census 2000 research and development efforts	Dr. Harry A. Scarr, Acting Director, Census Bureau	GAO
April 14, 1993	Federal standards for the collection of data on race and ethnicity	Acting Director Scarr	GAO; Dr. Manning Feinleib, Director, National Center for Health Statistics; Emerson Elliott, Commissioner, National Center for Education Statistics
May 27, 1993	Progress of 2000 planning; interim report of the National Academy of Sciences (NAS) Panel on Census Requirements in the Year 2000 and Beyond	Acting Director Scarr	GAO

See footnotes at end of table.

Date and committee or subcommittee ¹	Topic	Department of Commerce/ Census Bureau witnesses	Other federal government witnesses ²
June 30, 1993	Federal standards for the collection of data on race and ethnicity	None	None
July 29, 1993	Federal standards for the collection of data on race and ethnicity	None	Reps. Mineta (D-CA) and Frank (D-MA); Sen. Akaka (D-HI); Sally Katzen, Administrator, Office of Information and Regulatory Affairs in the Office of Management and Budget (OMB)
October 7, 1993	Status of Census 2000 plans; interim report of the NAS Panel to Evaluate Alternative Census Methods	Acting Director Scarr	GAO
November 3, 1993	Federal standards for the collection of data on race and ethnicity	None	Arthur Fletcher, Chairman, U.S. Commission on Civil Rights; Norma Cantu, Assistant Secretary for Civil Rights, Department of Education; Paul Williams, General Deputy Assistant Secretary, Department of Housing and Urban Development
January 26, 1994	Census Bureau's report to Congress on the status of Census 2000 planning efforts	Acting Director Scarr	GAO
July 21, 1994	Administration's proposed legislation to permit address list-sharing	Acting Director Scarr	U.S. Postal Service
September 27, 1994	Preparations for the 1995 Census Test; final report of the NAS Panel to Evaluate Alternative Census Methods (<i>Counting People in the Information Age</i>)	Acting Director Scarr	GAO
October 25, 1995 House Subcommittee on National Security, International Affairs, and Criminal Justice (of the Committee on Government Reform and Oversight)	Status of Census 2000 plans; Census Bureau report, "The Reengineered 2000 Census"	Francis D. DeGeorge, Inspector General; Dr. Martha Farnsworth Riche, Census Bureau Director	GAO
February 29, 1996 House Committee on Government Reform and Oversight	Census Bureau report, "The Plan for Census 2000"	None	Sen. Kohl (D-WI); Reps. Petri (R-WI) and Sawyer (D-OH)
June 6, 1996 House Committee on Government Reform and Oversight	Census 2000 methodological plans	Dr. Everett M. Ehrlich, Under Secretary for Economic Affairs; Director Riche	None
March 11, 1997 Senate Committee on Governmental Affairs	Refinements to the Census 2000 plan	William M. Daley, Secretary; Under Secretary Ehrlich; Director Riche	None
April 16, 1997 Senate Committee on Governmental Affairs	Use of sampling and statistical adjustment in Census 2000	None	None

See footnotes at end of table.

Date and committee or subcommittee ¹	Topic	Department of Commerce/ Census Bureau witnesses	Other federal government witnesses ²
April 23, 1997 House Subcommittee on Government Management, Information, and Technology (of the Committee on Government Reform and Oversight)	Federal standards for the collection of data on race and ethnicity	Director Riche, accompanied by Dr. Nancy M. Gordon, Associate Director for Demographic Programs	GAO; Reps. Meek (D-FL), Petri (R-WI), Sawyer (D-OH), and Waters (D-CA); Sally Katzen, OMB; Norma Cantu, Department of Education; Edward Sondik, Director, National Center for Health Statistics, Department of Health and Human Services
April 24, 1997 House Subcommittee on the Civil Service (of the Committee on Government Reform and Oversight)	Hiring welfare recipients for federal jobs (Director Riche's statement pertained to Census 2000 employment opportunities for welfare recipients)	Director Riche (submitted written statement only—did not testify)	Rep. Eddie Johnson (D-TX); John Koskinen, Deputy Director for Management, OMB; James King, Director, Office of Personnel Management; Diane Disney, Deputy Assistant Secretary of Defense, Department of Defense; Eugene Brickhouse, Assistant Secretary for Administration, Department of Veterans Affairs
April 29, 1997 House Subcommittee on National Security, International Affairs, and Criminal Justice	Promotion and outreach efforts for Census 2000	None	None
May 14, 1997 Senate Committee on Commerce, Science, and Transportation	Management challenges at the Department of Commerce (including Census 2000 management issues)	Ray Kammer, Acting Assistant Secretary for Administration and Chief Financial Officer; Inspector General DeGeorge	GAO
May 22 1997 House Subcommittee on Government Management, Information, and Technology	Federal standards for the collection of data on race and ethnicity	None	Sen. Akaka (D-HI)
July 25, 1997 House Subcommittee on Government Management, Information, and Technology	Federal standards for the collection of data on race and ethnicity (report of the Interagency Committee for the Review of Racial and Ethnic Standards)	Dr. Gordon, Associate Director for Demographic Programs	Reps. Gingrich (Speaker of the House) (R-GA), Sawyer (D-OH), Petri (R-WI), Waters (D-CA), Meek (D-FL), and Conyers (D-MI); Sally Katzen, OMB; Isabelle Katz Pinzler, Acting Assistant Attorney General for Civil Rights, Department of Justice
July 29, 1997 House Subcommittee on Government Management, Information, and Technology	Review of metropolitan statistical area standards	Dr. James D. Fitzsimmons, Chief, Population Distribution Branch, Population Division, accompanied Ms. Katzen of OMB	Reps. Holden (D-PA), Mink (D-HI), Hinchey (D-NY), Hunter (R-CA), and Redmond (R-NM); Sally Katzen, OMB
March 26, 1998 ⁴	GAO report, "Decennial Census: Preparations for Dress Rehearsal Underscore the Challenges for 2000"	James Holmes, Acting Director, Census Bureau; Paula Schneider, Principal Associate Director for Programs; John Thompson, Associate Director for Decennial Census	GAO

See footnotes at end of table.

Date and committee or subcommittee ¹	Topic	Department of Commerce/ Census Bureau witnesses	Other federal government witnesses ²
May 5, 1998	Revisiting the 1990 census	None	Reps. Sawyer (D-OH) and Petri (R-WI)
May 21, 1998	Census 2000 long- and short-form questionnaires		Reps. Morella (R-MD) and Canady (R-FL)
July 30, 1998 Senate Committee on Governmental Affairs	GAO report, "Decennial Census: Preliminary Observations on the Results to Date of the Dress Rehearsal and the Census Bureau's Readiness for 2000"	None	GAO
September 9, 1998	Review of Census Bureau planning and preparations in response to the federal court ruling that sampling is illegal	Dr. Robert J. Shapiro, Under Secretary for Economic Affairs; Acting Director Holmes	None
September 17, 1998	Serious problems with statistical adjustment remain	None	None
December 10, 1998	Field hearing (held in Dade County community chambers, Miami, FL)	None	Rep. Meek (D-FL)
January 29, 1999 House Committee on Government Reform	Field hearing (held in Phoenix city council chambers, Phoenix, AZ)	None	Rep. Hayworth (R-AZ)
February 11, 1999	Examining the benefits of postcensus local review	Census Bureau officials were not invited to testify, but Director Prewitt provided a written letter to the subcommittee.	Reps. Petri (R-WI) and Sawyer (D-OH); Kenneth Blackwell, Cochair, and Dr. Everett M. Ehrlich, member, Census Monitoring Board (CMB)
March 2, 1999	Examining the America Counts Today (ACT) initiative to enhance traditional enumeration methods	Director Kenneth Prewitt, Census Bureau	Reps. Myrick (R-NC) and Meek (D-FL)
May 4, 1999 Senate Committee on Indian Affairs	Census 2000 implementation in Indian country	Director Prewitt, accompanied by Belva Morrison, Team Leader, Denver Region, Census Bureau Tribal Partnership Program	None
June 9, 1999	Examining the Census Bureau's policy to count prisoners, military personnel, and Americans residing overseas	Director Prewitt	Reps. Gilman (R-NY) and Mark Green (R-WI)
June 28, 1999	Field hearing (held in Racine city council chambers, Racine, WI)	None	None
July 27, 1999	Examining the Census Bureau's paid advertising campaign	Director Prewitt	None
September 22, 1999	Discussion of the effects of including Puerto Rico in the 2000 U.S. population totals	Director Prewitt	Rep. Jose Serrano (D-NY); Resident Commissioner Carlos Romero-Barcelo (PR); Del. Eni Faleomavaega (D-American Samoa)

See footnotes at end of table.

Date and committee or subcommittee ¹	Topic	Department of Commerce/ Census Bureau witnesses	Other federal government witnesses ²
September 29, 1999	A midterm evaluation of the Local Update of Census Addresses Program	Director Prewitt; John Thompson, Associate Director for Decennial Census; Preston J. Waite, Assistant Director for Decennial Census	GAO
February 8, 2000	Examining the Status of Key Census 2000 Operations	Director Prewitt	None
February 15, 2000	Examining the GAO's Census 2000 oversight activities	None	GAO
March 8, 2000	Status of Census Bureau operations and activities	Director Prewitt	None
March 14, 2000	Status of key operations	None	GAO
April 5, 2000	Mailback response rates and status of key operations	Director Prewitt	GAO
May 5, 2000	Nonresponse follow-up and status of key operations	Director Prewitt	None
May 11, 2000	Status of nonresponse follow-up	None	GAO
May 19, 2000	Accuracy and Coverage Evaluation (A.C.E.): Still more questions than answers	Director Prewitt	None
June 22, 2000	Status of nonresponse follow-up and closeout	Director Prewitt	None
February 14, 2001	Release of preliminary A.C.E. estimates of net coverage in Census 2000	William Barron, Acting Director, Census Bureau, accompanied by John Thompson, Associate Director	None
March 28, 2001 Senate Committee on Commerce, Science, and Transportation	Review of the Secretary's redistricting data adjustment decision	Donald L. Evans, Secretary; Acting Director Barron	Reps. Dan Miller (R-FL), William Clay (D-MO), Henry Gonzalez (D-TX), and Carolyn Maloney (D-NY); Dr. David Murray, member, CMB

¹ Except as otherwise noted, all of the listed hearings between 1991 and 1994 (inclusive) were held by the Subcommittee on Census and Population of the House Committee on Post Office and Civil Service. The subcommittee was renamed the Subcommittee on Census, Statistics, and Postal Personnel in 1993.

² For purpose of brevity, only those witnesses affiliated with the federal government are listed here. Thus, for any given hearing, there may have been additional witnesses who testified.


³ In July 2004, Public Law 108-271 formally changed the name to Government Accountability Office.

⁴ Except as otherwise noted, all of the listed hearings between March 1998 and March 2001 (inclusive) were held by the House Subcommittee on the Census of the Committee on Government Reform and Oversight, renamed the Committee on Government Reform in the 106th Congress.

Appendix G: American Samoa Census Form


**Census
2000**
American
Samoa

U.S. Department of Commerce
Bureau of the Census



This is the official form for all the people at this address. It is quick and easy, and your answers are protected by law. Complete the Census and help your community get what it needs — today and in the future!

Start Here



Please use a black or blue pen. Do NOT mail this form, your completed form will be picked up by a census worker.

1

How many people were living or staying in this house, apartment, or mobile home on April 1, 2000?


Number of people

INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2000 who have no other permanent place to stay
- people living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while attending college
- people in a correctional facility, nursing home, or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- people who live or stay at another place most of the time



Please turn the page and print the names of all the people living or staying here on April 1, 2000.

Please fill out your form promptly. A census worker will visit your home to pick up your completed questionnaire or assist you if you have questions.

The Census Bureau estimates that, for the average household, this form will take about 62 minutes to complete, including the time for reviewing the instructions and answers. Comments about the estimate should be directed to the Associate Director for Finance and Administration, Attn: Paperwork Reduction Project 0607-0860, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget.

Form **D-13 AS**

OMB No. 0607-0860: Approval Expires 12/31/2000

List of Persons

→ Please be sure you answered question 1 on the front page before continuing.

2 Please print the names of all the people who you indicated in question 1 were living or staying here on April 1, 2000.

Example — Last Name

J O H N S O N

First Name MI

R O B I N J

Start with the person, or one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here.

Person 1 — Last Name

First Name MI

Person 2 — Last Name

First Name MI

Person 3 — Last Name

First Name MI

Person 4 — Last Name

First Name MI

Person 5 — Last Name

First Name MI

Person 6 — Last Name

First Name MI

Person 7 — Last Name

First Name MI

Person 8 — Last Name

First Name MI

Person 9 — Last Name

First Name MI

Person 10 — Last Name

First Name MI

Person 11 — Last Name

First Name MI

Person 12 — Last Name

First Name MI

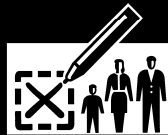
→ Next, answer questions about Person 1. If you didn't have room to list everyone who lives in this house or apartment, please tell this to the census worker when you are visited. The census worker will complete a census form for the additional people.

Form D-13 AS

2

Person

1



**Your answers
are important!
Every person in the
Census counts.**

- 1 What is this person's name?** *Print the name of Person 1 from page 2.*

Last Name

First Name

MI

- 2 What is this person's telephone number?** *We may contact this person if we don't understand an answer.*
Area Code + Number

- 3 What is this person's sex?** Mark ☒ ONE box.

- ☐ Male
☐ Female

- 4 What is this person's age and what is this person's date of birth?**

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

- 5 What is this person's ethnic origin or race?**

(For example: Chamorro, Samoan, White, Black, Carolinian, Filipino, Japanese, Korean, Palauan, Tongan, and so on.)

FOR OFFICE
USE ONLY

- 6 What is this person's marital status?**

- ☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married

- 7 a. At any time since February 1, 2000, has this person attended regular school or college?** *Include only pre-kindergarten, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.*

- ☐ No, has not attended since February 1 → *Skip to 8a*
☐ Yes, public school, public college
☐ Yes, private school, private college

- b. What grade or level was this person attending?**
Mark ☒ ONE box.

- ☐ Pre-kindergarten
☐ Kindergarten
☐ Grade 1 to grade 4
☐ Grade 5 to grade 8
☐ Grade 9 to grade 12
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school (for example: medical, dental, or law school)

- 8 a. What is the highest degree or level of school this person has COMPLETED?** Mark ☒ ONE box.
If currently enrolled, mark the previous grade or highest degree received.

- ☐ No schooling completed
☐ Pre-kindergarten to 4th grade
☐ 5th grade or 6th grade
☐ 7th grade or 8th grade
☐ 9th grade
☐ 10th grade
☐ 11th grade
☐ 12th grade, **NO DIPLOMA**
☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
☐ Some college credit, but less than 1 year
☐ 1 or more years of college, no degree
☐ Associate degree (for example: AA, AS)
☐ Bachelor's degree (for example: BA, AB, BS)
☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
☐ Doctorate degree (for example: PhD, EdD)

- b. Has this person completed the requirements for a vocational training program at a trade school, business school, hospital, some other kind of school for occupational training, or place of work?** *Do not include academic college courses.*

- ☐ No
☐ Yes, in this Area
☐ Yes, not in this Area

9243



Form D-13 AS

3

Person 1 (continued)

- 9 a. Does this person speak a language other than English at home?**

- ☐ Yes
☐ No → Skip to 10

- b. What is this language?**

(For example: Chamorro, Samoan, Carolinian, Tongan)

FOR OFFICE
USE ONLY

- c. Does this person speak this language at home more frequently than English?**

- ☐ Yes, more frequently than English
☐ Both equally often
☐ No, less frequently than English
☐ Does not speak English

- 10 Where was this person born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.**

FOR OFFICE
USE ONLY

- 11 Is this person a CITIZEN or NATIONAL of the United States?**

- ☐ Yes, born in this Area → Skip to 14a
☐ Yes, born in the United States or another U.S. territory or commonwealth
☐ Yes, born elsewhere of U.S. parent or parents
☐ Yes, a U.S. citizen by naturalization
☐ No, not a U.S. citizen or national (permanent resident)
☐ No, not a U.S. citizen or national (temporary resident)

- 12 When did this person come to this Area to stay? If this person has entered the Area more than once, what is the latest year? Print numbers in boxes.**

Year

- 13 What was this person's main reason for moving to this Area?**

- ☐ Employment
☐ Military
☐ Subsistence activities
☐ Missionary activities
☐ Moved with spouse or parent
☐ To attend school
☐ Medical
☐ Housing
☐ Other

- 14 a. Where was this person's mother born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.**

FOR OFFICE
USE ONLY

- b. Where was this person's father born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.**

FOR OFFICE
USE ONLY

- 15 Is this person a dependent of an active-duty or retired member of the Armed Forces of the United States or of the full-time military Reserves or National Guard? "Active duty" does NOT include training for the military Reserves or National Guard.**

- ☐ Yes, dependent of an active-duty member of the Armed Forces
☐ Yes, dependent of retired member of the Armed Forces, or dependent of an active-duty or retired member of full-time National Guard or Armed Forces Reserve
☐ No

- 16 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?**

- ☐ Person is under 5 years old → Skip to 35
☐ Yes, this house → Skip to 17
☐ No, different house

- b. Where did this person live 5 years ago?**

Name of the island, U.S. state, commonwealth, territory, or foreign country. If outside this Area, print the answer below and skip to 17.

FOR OFFICE
USE ONLY

- c. Name of city, town, or village**

FOR OFFICE
USE ONLY

- 17 Does this person have any of the following long-lasting conditions:**

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Blindness, deafness, or a severe vision or hearing impairment? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying? | <input type="checkbox"/> | <input type="checkbox"/> |

Person 1 (continued)

- 25 a. How did this person usually get to work LAST WEEK?** *Do not include transportation to subsistence activity. If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

☐ Car, truck, or private van/bus
☐ Public van/bus
☐ Boat
☐ Taxicab
☐ Motorcycle
☐ Bicycle
☐ Walked
☐ Worked at home → *Skip to 29*
☐ Other method

- **If "Car, truck, or private van/bus" is marked in 25a, go to 25b. Otherwise, skip to 26a.**

- 25 b. How many people, including this person, usually rode to work in the car, truck, or private van/bus LAST WEEK?**

☐ Drove alone
☐ 2 people
☐ 3 people
☐ 4 people
☐ 5 or 6 people
☐ 7 or more people

- 26 a. What time did this person usually leave home to go to work LAST WEEK?**

: ☐ a.m. ☐ p.m.

- b. How many minutes did it usually take this person to get from home to work LAST WEEK?**

Minutes

- **Answer questions 27–28 for persons who did not work for pay or profit last week. Others skip to 29.**

- 27 a. LAST WEEK, was this person on layoff from a job?**

☐ Yes → *Skip to 27c*
☐ No

- b. LAST WEEK, was this person TEMPORARILY absent from a job or business?**

☐ Yes, on vacation, temporary illness, labor dispute, etc. → *Skip to 28*
☐ No → *Skip to 27d*

- c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?**

☐ Yes → *Skip to 27e*
☐ No

- 27 d. Has this person been looking for work during the last 4 weeks?**

☐ Yes
☐ No → *Skip to 28*

- e. LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?**

☐ Yes, could have gone to work
☐ No, because of own temporary illness
☐ No, because of all other reasons (*in school, etc.*)

- 28 When did this person last work, even for a few days?** *Do not include subsistence activity.*

☐ 2000
☐ 1999
☐ 1998
☐ 1995 to 1997
☐ 1990 to 1994 → *Skip to 33*
☐ 1989 or earlier → *Skip to 33*
☐ Never worked; or did subsistence only → *Skip to 33*

- 29 Industry or Employer** — *Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.*

- a. For whom did this person work?** *If now on active duty in the Armed Forces, mark (X) this box → and print the branch of the Armed Forces.*

Name of company, business, or other employer

FOR OFFICE
USE ONLY

- b. What kind of business or industry was this?**

Describe the activity at location where employed. (For example: hospital, fish cannery, watchmaker, auto repair shop, bank)

- c. Is this mainly** — Mark (X) ONE box.

☐ Manufacturing?
☐ Wholesale trade?
☐ Retail trade?
☐ Other (*agriculture, construction, service, government, etc.*)?

Person 1 (continued)

33 g. Retirement, survivor, or disability pensions — Do NOT include Social Security.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

h. Any remittances — Include money from relatives outside the household or in the military.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

i. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

34 What was this person's total income in 1999? Add entries in questions 33a—33i; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

- Annual amount — Dollars
☐ None OR \$, .00 ☐ Loss

➔ Now, please answer questions 35—61 about your household.

35 Is this living quarters —

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent?

36 Which best describes this building? Include all apartments, flats, etc., even if vacant.

- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ Two houses — **Applies only in American Samoa**
- ☐ Three or more houses — **Applies only in American Samoa**
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 to 49 apartments
- ☐ A building with 50 or more apartments
- ☐ A container
- ☐ Boat, RV, van, etc.

37 About when was this building first built?

- ☐ 1999 or 2000 ☐ 1960 to 1969
- ☐ 1995 to 1998 ☐ 1950 to 1959
- ☐ 1990 to 1994 ☐ 1940 to 1949
- ☐ 1980 to 1989 ☐ 1939 or earlier
- ☐ 1970 to 1979

38 When did this person move into this living quarters?

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1969 or earlier

39 How many rooms do you have in this living quarters? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

- ☐ 1 room ☐ 6 rooms
- ☐ 2 rooms ☐ 7 rooms
- ☐ 3 rooms ☐ 8 rooms
- ☐ 4 rooms ☐ 9 or more rooms
- ☐ 5 rooms

40 How many bedrooms do you have; that is, how many bedrooms would you list if this living quarters were on the market for sale or rent?

- ☐ No bedroom
- ☐ 1 bedroom
- ☐ 2 bedrooms
- ☐ 3 bedrooms
- ☐ 4 bedrooms
- ☐ 5 or more bedrooms

41 a. Do you have hot and cold piped water?

- ☐ Yes, in this unit
- ☐ Yes, in this building, not in unit
- ☐ No, only cold piped water in this unit
- ☐ No, only cold piped water in this building
- ☐ No, only cold piped water outside this building
- ☐ No piped water

b. Do you have a bathtub or shower?

- ☐ Yes, in this unit
- ☐ Yes, in this building, not in unit
- ☐ Yes, outside this building
- ☐ No

Person 1 (continued)

41

c. Do you have a flush toilet?

- ☐ Yes, in this unit → *Skip to 42a*
- ☐ Yes, in this building, not in unit → *Skip to 42a*
- ☐ Yes, outside this building → *Skip to 42a*
- ☐ No

d. What type of toilet facilities do you have?

- ☐ Outhouse or privy
- ☐ Other or none

42

a. Are your MAIN cooking facilities located inside or outside this building?

- ☐ Inside this building
- ☐ Outside this building
- ☐ No cooking facilities → *Skip to 42c*

b. What type of cooking facilities are these?

- ☐ Electric stove
- ☐ Kerosene stove
- ☐ Gas stove
- ☐ Microwave oven and non-portable burners
- ☐ Microwave oven only
- ☐ Other (fireplace, hotplate, etc.)

c. Do you have a refrigerator in this building?

- ☐ Yes
- ☐ No

d. Do you have a sink with piped water in this building?

- ☐ Yes
- ☐ No

43

Is there telephone service available in this living quarters from which you can both make and receive calls?

- ☐ Yes
- ☐ No

44

Do you have air conditioning?

- ☐ Yes, a central air-conditioning system (includes split-type)
- ☐ Yes, 1 individual room unit
- ☐ Yes, 2 or more individual room units
- ☐ No

45

How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

- | | |
|-------------------------------|------------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 or more |
| <input type="checkbox"/> 3 | |

46

Do you have a battery operated radio? Count car radios, transistors, and other battery operated sets in working order or needing only a new battery for operation.

- ☐ Yes, 1 or more
- ☐ No

47

Do you get water from —

- ☐ A public system only?
- ☐ A public system and catchment?
- ☐ A village water system only? — ***Applies only in American Samoa***
- ☐ An individual well?
- ☐ A catchment, tanks, or drums only?
- ☐ Some other source such as a standpipe, spring, river, creek, etc.?

48

Is this building connected to a public sewer?

- ☐ Yes, connected to public sewer
- ☐ No, connected to septic tank or cesspool
- ☐ No, use other means

49

Is this living quarters part of a condominium?

- ☐ Yes
- ☐ No

50

What is the MAIN type of material used for the outside walls of this building?

- ☐ Poured concrete
- ☐ Concrete blocks
- ☐ Metal
- ☐ Wood
- ☐ Other

51

What is the MAIN type of material used for the roof of this building?

- ☐ Poured concrete
- ☐ Metal
- ☐ Wood
- ☐ Other

52

What is the MAIN type of material used for the foundation of this building?

- ☐ Concrete
- ☐ Wood pier or pilings
- ☐ Other

53

Answer ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME — All others skip to 54a.

Is there a business (such as a store or shop) or a medical office on THIS property?

- ☐ Yes
- ☐ No

54

a. What is the average monthly cost for electricity for this living quarters?

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or electricity not used



Person 1 (continued)

- 54 b. What is the average monthly cost for gas for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or gas not used

- c. What is the average monthly cost for water and sewer for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge

- d. What is the average monthly cost for oil, coal, kerosene, wood, etc. for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or these fuels not used

- 55 a. Answer 55b ONLY if RENT IS PAID for this living quarters — All others skip to 56.**

- b. What is the monthly rent?**

Monthly amount — Dollars

\$, .00

- 56 Answer questions 56a—61 if you or someone in this household owns or is buying this living quarters; otherwise, skip to questions for Person 2.**

- a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?**

- ☐ Yes, mortgage, deed of trust, or similar debt
☐ Yes, contract to purchase
☐ No → Skip to 57a

- b. How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.**

Monthly amount — Dollars

\$, .00

OR

- ☐ No regular payment required → Skip to 57a

- c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?**

- ☐ Yes, taxes included in mortgage payment
☐ No, taxes paid separately or taxes not required

- 56 d. Does your regular monthly mortgage payment include payments for fire, hazard, typhoon, or flood insurance on THIS property?**

- ☐ Yes, insurance included in mortgage payment
☐ No, insurance paid separately or no insurance

- 57 a. Do you have a second mortgage or a home equity loan on THIS property? Mark ☒ all boxes that apply.**

- ☐ Yes, a second mortgage
☐ Yes, a home equity loan
☐ No → Skip to 58

- b. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?**

Monthly amount — Dollars

\$, .00

OR

- ☐ No regular payment required

- 58 What were the real estate taxes on THIS property last year?**

Yearly amount — Dollars

\$, .00

OR

- ☐ None

- 59 What was the annual payment for fire, hazard, typhoon, and flood insurance on THIS property?**

Annual amount — Dollars

\$, .00

OR

- ☐ None

- 60 What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?**

Value of property — Dollars

\$, , .00

- 61 Answer ONLY if this is a CONDOMINIUM — What is the monthly condominium fee?**

Monthly amount — Dollars

\$, .00

- Are there more people living here? If yes, continue with Person 2.**

The Census Bureau estimates that, for the average household, this form will take about 45 minutes to complete, including the time for reviewing the instructions and answers. Comments about the estimate should be directed to the Associate Director for Finance and Administration, Attn: Paperwork Reduction Project 0607-0860, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget.

OMB No. 0607-0860: Approval Expires 12/31/2000

List of Persons

➔ Please be sure you answered question 1 on the front page before continuing.

2 Please print the names of all the people who you indicated in question 1 were living or staying here on April 1, 2000.

Example — Last Name

J O H N S O N

First Name MI

R O B I N J

Start with the person, or one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here.

Person 1 — Last Name

First Name MI

Person 2 — Last Name

First Name MI

Person 3 — Last Name

First Name MI

Person 4 — Last Name

First Name MI

Person 5 — Last Name

First Name MI

Person 6 — Last Name

First Name MI

Person 7 — Last Name

First Name MI

Person 8 — Last Name

First Name MI

Person 9 — Last Name

First Name MI

Person 10 — Last Name

First Name MI

Person 11 — Last Name

First Name MI

Person 12 — Last Name

First Name MI

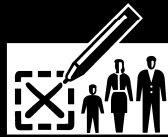
➔ Next, answer questions about Person 1. If you didn't have room to list everyone who lives in this house or apartment, please tell this to the census worker when you are visited. The census worker will complete a census form for the additional people.

Form D-13 CNMI

2

Person

1



**Your answers
are important!
Every person in the
Census counts.**

- 1 What is this person's name?** *Print the name of Person 1 from page 2.*

Last Name

First Name

MI

- 2 What is this person's telephone number?** *We may contact this person if we don't understand an answer.*
Area Code + Number

- 3 What is this person's sex?** Mark ☒ ONE box.

- ☐ Male
☐ Female

- 4 What is this person's age and what is this person's date of birth?**

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

- 5 What is this person's ethnic origin or race?**

(For example: Chamorro, Samoan, White, Black, Carolinian, Filipino, Japanese, Korean, Palauan, Tongan, and so on.)

FOR OFFICE
USE ONLY

- 6 What is this person's marital status?**

- ☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married

- 7 a. At any time since February 1, 2000, has this person attended regular school or college?** *Include only pre-kindergarten, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.*

- ☐ No, has not attended since February 1 → *Skip to 8a*
☐ Yes, public school, public college
☐ Yes, private school, private college

- b. What grade or level was this person attending?**
Mark ☒ ONE box.

- ☐ Pre-kindergarten
☐ Kindergarten
☐ Grade 1 to grade 4
☐ Grade 5 to grade 8
☐ Grade 9 to grade 12
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school (for example: medical, dental, or law school)

- 8 a. What is the highest degree or level of school this person has COMPLETED?** Mark ☒ ONE box.
If currently enrolled, mark the previous grade or highest degree received.

- ☐ No schooling completed
☐ Pre-kindergarten to 4th grade
☐ 5th grade or 6th grade
☐ 7th grade or 8th grade
☐ 9th grade
☐ 10th grade
☐ 11th grade
☐ 12th grade, **NO DIPLOMA**
☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
☐ Some college credit, but less than 1 year
☐ 1 or more years of college, no degree
☐ Associate degree (for example: AA, AS)
☐ Bachelor's degree (for example: BA, AB, BS)
☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
☐ Doctorate degree (for example: PhD, EdD)

- b. Has this person completed the requirements for a vocational training program at a trade school, business school, hospital, some other kind of school for occupational training, or place of work?** *Do not include academic college courses.*

- ☐ No
☐ Yes, in this Area
☐ Yes, not in this Area



Person 1 (continued)

- 9 a. Does this person speak a language other than English at home?**

- ☐ Yes
☐ No → Skip to 10

- b. What is this language?**

(For example: Chamorro, Samoan, Carolinian, Tongan)

FOR OFFICE
USE ONLY

- c. Does this person speak this language at home more frequently than English?**

- ☐ Yes, more frequently than English
☐ Both equally often
☐ No, less frequently than English
☐ Does not speak English

- 10 Where was this person born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.**

FOR OFFICE
USE ONLY

- 11 Is this person a CITIZEN or NATIONAL of the United States?**

- ☐ Yes, born in this Area → Skip to 14a
☐ Yes, born in the United States or another U.S. territory or commonwealth
☐ Yes, born elsewhere of U.S. parent or parents
☐ Yes, a U.S. citizen by naturalization
☐ No, not a U.S. citizen or national (permanent resident)
☐ No, not a U.S. citizen or national (temporary resident)

- 12 When did this person come to this Area to stay? If this person has entered the Area more than once, what is the latest year? Print numbers in boxes.**

Year

- 13 What was this person's main reason for moving to this Area?**

- ☐ Employment
☐ Military
☐ Subsistence activities
☐ Missionary activities
☐ Moved with spouse or parent
☐ To attend school
☐ Medical
☐ Housing
☐ Other

- 14 a. Where was this person's mother born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.**

FOR OFFICE
USE ONLY

- b. Where was this person's father born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.**

FOR OFFICE
USE ONLY

- 15 Is this person a dependent of an active-duty or retired member of the Armed Forces of the United States or of the full-time military Reserves or National Guard? "Active duty" does NOT include training for the military Reserves or National Guard.**

- ☐ Yes, dependent of an active-duty member of the Armed Forces
☐ Yes, dependent of retired member of the Armed Forces, or dependent of an active-duty or retired member of full-time National Guard or Armed Forces Reserve
☐ No

- 16 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?**

- ☐ Person is under 5 years old → Skip to 35
☐ Yes, this house → Skip to 17
☐ No, different house

- b. Where did this person live 5 years ago?**

Name of the island, U.S. state, commonwealth, territory, or foreign country. If outside this Area, print the answer below and skip to 17.

FOR OFFICE
USE ONLY

- c. Name of city, town, or village**

FOR OFFICE
USE ONLY

- 17 Does this person have any of the following long-lasting conditions:**

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Blindness, deafness, or a severe vision or hearing impairment? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying? | <input type="checkbox"/> | <input type="checkbox"/> |

Person 1 (continued)

- 25 a. How did this person usually get to work LAST WEEK?** *Do not include transportation to subsistence activity. If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

☐ Car, truck, or private van/bus
☐ Public van/bus
☐ Boat
☐ Taxicab
☐ Motorcycle
☐ Bicycle
☐ Walked
☐ Worked at home → *Skip to 29*
☐ Other method

- **If "Car, truck, or private van/bus" is marked in 25a, go to 25b. Otherwise, skip to 26a.**

- 25 b. How many people, including this person, usually rode to work in the car, truck, or private van/bus LAST WEEK?**

☐ Drove alone
☐ 2 people
☐ 3 people
☐ 4 people
☐ 5 or 6 people
☐ 7 or more people

- 26 a. What time did this person usually leave home to go to work LAST WEEK?**

: ☐ a.m. ☐ p.m.

- b. How many minutes did it usually take this person to get from home to work LAST WEEK?**

Minutes

- **Answer questions 27–28 for persons who did not work for pay or profit last week. Others skip to 29.**

- 27 a. LAST WEEK, was this person on layoff from a job?**

☐ Yes → *Skip to 27c*
☐ No

- b. LAST WEEK, was this person TEMPORARILY absent from a job or business?**

☐ Yes, on vacation, temporary illness, labor dispute, etc. → *Skip to 28*
☐ No → *Skip to 27d*

- c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?**

☐ Yes → *Skip to 27e*
☐ No

- 27 d. Has this person been looking for work during the last 4 weeks?**

☐ Yes
☐ No → *Skip to 28*

- e. LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?**

☐ Yes, could have gone to work
☐ No, because of own temporary illness
☐ No, because of all other reasons (*in school, etc.*)

- 28 When did this person last work, even for a few days?** *Do not include subsistence activity.*

☐ 2000
☐ 1999
☐ 1998
☐ 1995 to 1997
☐ 1990 to 1994 → *Skip to 33*
☐ 1989 or earlier → *Skip to 33*
☐ Never worked; or did subsistence only → *Skip to 33*

- 29 Industry or Employer** — *Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.*

- a. For whom did this person work?** *If now on active duty in the Armed Forces, mark (X) this box → and print the branch of the Armed Forces.*

Name of company, business, or other employer

FOR OFFICE
USE ONLY ☐

- b. What kind of business or industry was this?**

Describe the activity at location where employed. (For example: hospital, fish cannery, watchmaker, auto repair shop, bank)

- c. Is this mainly** — Mark (X) ONE box.

☐ Manufacturing?
☐ Wholesale trade?
☐ Retail trade?
☐ Other (*agriculture, construction, service, government, etc.*)?

Person 1 (continued)

33 g. Retirement, survivor, or disability pensions —
Do NOT include Social Security.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

h. Any remittances — Include money from relatives outside the household or in the military.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

i. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

34 What was this person's total income in 1999? Add entries in questions 33a—33i; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

- Annual amount — Dollars
☐ None OR \$, .00 ☐ Loss

→ Now, please answer questions 35—61 about your household.

35 Is this living quarters —

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent?

36 Which best describes this building? Include all apartments, flats, etc., even if vacant.

- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ Two houses — **Applies only in American Samoa**
- ☐ Three or more houses — **Applies only in American Samoa**
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 to 49 apartments
- ☐ A building with 50 or more apartments
- ☐ A container
- ☐ Boat, RV, van, etc.

37 About when was this building first built?

- ☐ 1999 or 2000 ☐ 1960 to 1969
- ☐ 1995 to 1998 ☐ 1950 to 1959
- ☐ 1990 to 1994 ☐ 1940 to 1949
- ☐ 1980 to 1989 ☐ 1939 or earlier
- ☐ 1970 to 1979

38 When did this person move into this living quarters?

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1969 or earlier

39 How many rooms do you have in this living quarters? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

- ☐ 1 room ☐ 6 rooms
- ☐ 2 rooms ☐ 7 rooms
- ☐ 3 rooms ☐ 8 rooms
- ☐ 4 rooms ☐ 9 or more rooms
- ☐ 5 rooms

40 How many bedrooms do you have; that is, how many bedrooms would you list if this living quarters were on the market for sale or rent?

- ☐ No bedroom
- ☐ 1 bedroom
- ☐ 2 bedrooms
- ☐ 3 bedrooms
- ☐ 4 bedrooms
- ☐ 5 or more bedrooms

41 a. Do you have hot and cold piped water?

- ☐ Yes, in this unit
- ☐ Yes, in this building, not in unit
- ☐ No, only cold piped water in this unit
- ☐ No, only cold piped water in this building
- ☐ No, only cold piped water outside this building
- ☐ No piped water

b. Do you have a bathtub or shower?

- ☐ Yes, in this unit
- ☐ Yes, in this building, not in unit
- ☐ Yes, outside this building
- ☐ No

Person 1 (continued)

41

c. Do you have a flush toilet?

- ☐ Yes, in this unit → *Skip to 42a*
- ☐ Yes, in this building, not in unit → *Skip to 42a*
- ☐ Yes, outside this building → *Skip to 42a*
- ☐ No

d. What type of toilet facilities do you have?

- ☐ Outhouse or privy
- ☐ Other or none

42

a. Are your MAIN cooking facilities located inside or outside this building?

- ☐ Inside this building
- ☐ Outside this building
- ☐ No cooking facilities → *Skip to 42c*

b. What type of cooking facilities are these?

- ☐ Electric stove
- ☐ Kerosene stove
- ☐ Gas stove
- ☐ Microwave oven and non-portable burners
- ☐ Microwave oven only
- ☐ Other (fireplace, hotplate, etc.)

c. Do you have a refrigerator in this building?

- ☐ Yes
- ☐ No

d. Do you have a sink with piped water in this building?

- ☐ Yes
- ☐ No

43

Is there telephone service available in this living quarters from which you can both make and receive calls?

- ☐ Yes
- ☐ No

44

Do you have air conditioning?

- ☐ Yes, a central air-conditioning system (includes split-type)
- ☐ Yes, 1 individual room unit
- ☐ Yes, 2 or more individual room units
- ☐ No

45

How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

- | | |
|-------------------------------|------------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 or more |
| <input type="checkbox"/> 3 | |

46

Do you have a battery operated radio? Count car radios, transistors, and other battery operated sets in working order or needing only a new battery for operation.

- ☐ Yes, 1 or more
- ☐ No

47

Do you get water from —

- ☐ A public system only?
- ☐ A public system and catchment?
- ☐ A village water system only? — ***Applies only in American Samoa***
- ☐ An individual well?
- ☐ A catchment, tanks, or drums only?
- ☐ Some other source such as a standpipe, spring, river, creek, etc.?

48

Is this building connected to a public sewer?

- ☐ Yes, connected to public sewer
- ☐ No, connected to septic tank or cesspool
- ☐ No, use other means

49

Is this living quarters part of a condominium?

- ☐ Yes
- ☐ No

50

What is the MAIN type of material used for the outside walls of this building?

- ☐ Poured concrete
- ☐ Concrete blocks
- ☐ Metal
- ☐ Wood
- ☐ Other

51

What is the MAIN type of material used for the roof of this building?

- ☐ Poured concrete
- ☐ Metal
- ☐ Wood
- ☐ Other

52

What is the MAIN type of material used for the foundation of this building?

- ☐ Concrete
- ☐ Wood pier or pilings
- ☐ Other

53

Answer ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME — All others skip to 54a.

Is there a business (such as a store or shop) or a medical office on THIS property?

- ☐ Yes
- ☐ No

54

a. What is the average monthly cost for electricity for this living quarters?

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or electricity not used



Person 1 (continued)

- 54 b. What is the average monthly cost for gas for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or gas not used

- c. What is the average monthly cost for water and sewer for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge

- d. What is the average monthly cost for oil, coal, kerosene, wood, etc. for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or these fuels not used

- 55 a. Answer 55b ONLY if RENT IS PAID for this living quarters — All others skip to 56.**

- b. What is the monthly rent?**

Monthly amount — Dollars

\$, .00

- 56 Answer questions 56a—61 if you or someone in this household owns or is buying this living quarters; otherwise, skip to questions for Person 2.**

- a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?**

- ☐ Yes, mortgage, deed of trust, or similar debt
☐ Yes, contract to purchase
☐ No → Skip to 57a

- b. How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.**

Monthly amount — Dollars

\$, .00

OR

- ☐ No regular payment required → Skip to 57a

- c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?**

- ☐ Yes, taxes included in mortgage payment
☐ No, taxes paid separately or taxes not required

- 56 d. Does your regular monthly mortgage payment include payments for fire, hazard, typhoon, or flood insurance on THIS property?**

- ☐ Yes, insurance included in mortgage payment
☐ No, insurance paid separately or no insurance

- 57 a. Do you have a second mortgage or a home equity loan on THIS property? Mark ☒ all boxes that apply.**

- ☐ Yes, a second mortgage
☐ Yes, a home equity loan
☐ No → Skip to 58

- b. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?**

Monthly amount — Dollars

\$, .00

OR

- ☐ No regular payment required

- 58 What were the real estate taxes on THIS property last year?**

Yearly amount — Dollars

\$, .00

OR

- ☐ None

- 59 What was the annual payment for fire, hazard, typhoon, and flood insurance on THIS property?**

Annual amount — Dollars

\$, .00

OR

- ☐ None

- 60 What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?**

Value of property — Dollars

\$, , .00

- 61 Answer ONLY if this is a CONDOMINIUM — What is the monthly condominium fee?**

Monthly amount — Dollars


\$, .00

- Are there more people living here? If yes, continue with Person 2.**

Appendix I: Guam Census Form


**Census
2000**
Guam

U.S. Department of Commerce
Bureau of the Census



This is the official form for all the people at this address.
It is quick and easy, and your answers are protected by
law. Complete the Census and help your community get
what it needs — today and in the future!

Start Here



Please use a black or
blue pen. Do NOT mail this form, your completed
form will be picked up by a census worker.

1

How many people were living or staying in this house,
apartment, or mobile home on April 1, 2000?


Number of people

INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2000 who
have no other permanent place to stay
- people living here most of the time while
working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while
attending college
- people in a correctional facility, nursing home,
or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- people who live or stay at another place most
of the time



Please turn the page and print the names of all the
people living or staying here on April 1, 2000.

Please fill out your form promptly. A census worker will visit your
home to pick up your completed questionnaire or assist you if
you have questions.

The Census Bureau estimates that, for the average household, this form will take about 41 minutes to complete, including the time for reviewing the instructions and answers. Comments about the estimate should be directed to the Associate Director for Finance and Administration, Attn: Paperwork Reduction Project 0607-0860, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget.

Form **D-13 G**

OMB No. 0607-0860: Approval Expires 12/31/2000

List of Persons

➔ Please be sure you answered question 1 on the front page before continuing.

2 Please print the names of all the people who you indicated in question 1 were living or staying here on April 1, 2000.

Example — Last Name

J O H N S O N

First Name MI

R O B I N J

Start with the person, or one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here.

Person 1 — Last Name

First Name MI

Person 2 — Last Name

First Name MI

Person 3 — Last Name

First Name MI

Person 4 — Last Name

First Name MI

Person 5 — Last Name

First Name MI

Person 6 — Last Name

First Name MI

Person 7 — Last Name

First Name MI

Person 8 — Last Name

First Name MI

Person 9 — Last Name

First Name MI

Person 10 — Last Name

First Name MI

Person 11 — Last Name

First Name MI

Person 12 — Last Name

First Name MI

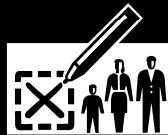
➔ Next, answer questions about Person 1. If you didn't have room to list everyone who lives in this house or apartment, please tell this to the census worker when you are visited. The census worker will complete a census form for the additional people.

Form D-13 G

2

Person

1



**Your answers
are important!
Every person in the
Census counts.**

- 1 What is this person's name?** *Print the name of Person 1 from page 2.*

Last Name

First Name

MI

- 2 What is this person's telephone number?** *We may contact this person if we don't understand an answer.*
Area Code + Number

- 3 What is this person's sex?** Mark ☒ ONE box.

- ☐ Male
☐ Female

- 4 What is this person's age and what is this person's date of birth?**

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

- 5 What is this person's ethnic origin or race?**

(For example: Chamorro, Samoan, White, Black, Carolinian, Filipino, Japanese, Korean, Palauan, Tongan, and so on.)

FOR OFFICE
USE ONLY

- 6 What is this person's marital status?**

- ☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married

- 7 a. At any time since February 1, 2000, has this person attended regular school or college?** *Include only pre-kindergarten, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.*

- ☐ No, has not attended since February 1 → *Skip to 8a*
☐ Yes, public school, public college
☐ Yes, private school, private college

- b. What grade or level was this person attending?**
Mark ☒ ONE box.

- ☐ Pre-kindergarten
☐ Kindergarten
☐ Grade 1 to grade 4
☐ Grade 5 to grade 8
☐ Grade 9 to grade 12
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school (for example: medical, dental, or law school)

- 8 a. What is the highest degree or level of school this person has COMPLETED?** Mark ☒ ONE box.
If currently enrolled, mark the previous grade or highest degree received.

- ☐ No schooling completed
☐ Pre-kindergarten to 4th grade
☐ 5th grade or 6th grade
☐ 7th grade or 8th grade
☐ 9th grade
☐ 10th grade
☐ 11th grade
☐ 12th grade, **NO DIPLOMA**
☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
☐ Some college credit, but less than 1 year
☐ 1 or more years of college, no degree
☐ Associate degree (for example: AA, AS)
☐ Bachelor's degree (for example: BA, AB, BS)
☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
☐ Doctorate degree (for example: PhD, EdD)

- b. Has this person completed the requirements for a vocational training program at a trade school, business school, hospital, some other kind of school for occupational training, or place of work?** *Do not include academic college courses.*

- ☐ No
☐ Yes, in this Area
☐ Yes, not in this Area

9443



Form D-13 G

3

Person 1 (continued)

9 a. Does this person speak a language other than English at home?

- ☐ Yes
☐ No → Skip to 10

b. What is this language?

(For example: Chamorro, Samoan, Carolinian, Tongan)

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c. Does this person speak this language at home more frequently than English?

- ☐ Yes, more frequently than English
☐ Both equally often
☐ No, less frequently than English
☐ Does not speak English

10 Where was this person born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.

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USE ONLY

11 Is this person a CITIZEN or NATIONAL of the United States?

- ☐ Yes, born in this Area → Skip to 14a
☐ Yes, born in the United States or another U.S. territory or commonwealth
☐ Yes, born elsewhere of U.S. parent or parents
☐ Yes, a U.S. citizen by naturalization
☐ No, not a U.S. citizen or national (permanent resident)
☐ No, not a U.S. citizen or national (temporary resident)

12 When did this person come to this Area to stay? If this person has entered the Area more than once, what is the latest year? Print numbers in boxes.

Year

13 What was this person's main reason for moving to this Area?

- ☐ Employment
☐ Military
☐ Subsistence activities
☐ Missionary activities
☐ Moved with spouse or parent
☐ To attend school
☐ Medical
☐ Housing
☐ Other

14 a. Where was this person's mother born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.

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b. Where was this person's father born? Print the name of the island (village in American Samoa), U.S. state, commonwealth, territory, or foreign country.

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USE ONLY

15 Is this person a dependent of an active-duty or retired member of the Armed Forces of the United States or of the full-time military Reserves or National Guard? "Active duty" does NOT include training for the military Reserves or National Guard.

- ☐ Yes, dependent of an active-duty member of the Armed Forces
☐ Yes, dependent of retired member of the Armed Forces, or dependent of an active-duty or retired member of full-time National Guard or Armed Forces Reserve
☐ No

16 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?

- ☐ Person is under 5 years old → Skip to 35
☐ Yes, this house → Skip to 17
☐ No, different house

b. Where did this person live 5 years ago?

Name of the island, U.S. state, commonwealth, territory, or foreign country. If outside this Area, print the answer below and skip to 17.

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c. Name of city, town, or village

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USE ONLY

17 Does this person have any of the following long-lasting conditions:

- | | Yes | No |
|--|--------------------------|--------------------------|
| a. Blindness, deafness, or a severe vision or hearing impairment? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying? | <input type="checkbox"/> | <input type="checkbox"/> |

Person 1 (continued)

- 18** Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:

	Yes	No
a. Learning, remembering, or concentrating?	<input type="checkbox"/>	<input type="checkbox"/>
b. Dressing, bathing, or getting around inside the home?	<input type="checkbox"/>	<input type="checkbox"/>
c. (Answer if this person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor's office?	<input type="checkbox"/>	<input type="checkbox"/>
d. (Answer if this person is 16 YEARS OLD OR OVER.) Working at a job or business?	<input type="checkbox"/>	<input type="checkbox"/>

- 19** Was this person under 15 years of age on April 1, 2000?

☐ Yes → Skip to 35
☐ No

- 20** a. If this person is female, how many babies has she ever had, not counting stillbirths? Do not count stepchildren or children she has adopted.

☐ None → Skip to 21a
☐ 1 ☐ 6 ☐ 11
☐ 2 ☐ 7 ☐ 12
☐ 3 ☐ 8 ☐ 13
☐ 4 ☐ 9 ☐ 14
☐ 5 ☐ 10 ☐ 15 or more

- b.** What was the date of birth of the last child born to this person? Print numbers in boxes.

Month Day Year of birth

- 21** a. Does this person have any of his/her own grandchildren under the age of 18 living in this house or apartment?

☐ Yes
☐ No → Skip to 22a

- b.** Is this grandparent currently responsible for most of the basic needs of any grandchild(ren) under the age of 18 who live(s) in this house or apartment?

☐ Yes
☐ No → Skip to 22a

- c.** How long has this grandparent been responsible for the(se) grandchild(ren)? If the grandparent is financially responsible for more than one grandchild, answer the question for the grandchild for whom the grandparent has been responsible for the longest period of time.

☐ Less than 6 months
☐ 6 to 11 months
☐ 1 or 2 years
☐ 3 or 4 years
☐ 5 years or more

- 22** a. Has this person ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.

☐ Yes, now on active duty
☐ Yes, on active duty in past, but not now
☐ No, training for Reserves or National Guard only → Skip to 23
☐ No, never served in the military → Skip to 23

- b.** When did this person serve on active duty in the U.S. Armed Forces? Mark (X) a box for EACH period in which this person served.

☐ April 1995 or later
☐ August 1990 to March 1995 (including Persian Gulf War)
☐ September 1980 to July 1990
☐ May 1975 to August 1980
☐ Vietnam era (August 1964—April 1975)
☐ February 1955 to July 1964
☐ Korean conflict (June 1950—January 1955)
☐ World War II (September 1940—July 1947)
☐ Some other time

- c.** In total, how many years of active-duty military service has this person had?

☐ Less than 2 years
☐ 2 years or more

- 23** LAST WEEK, did this person do ANY work for either pay or profit? Answer "Yes" even if the person worked only 1 hour, or helped without pay in a family business or farm for 15 hours or more, or was on active duty in the Armed Forces. Also indicate whether the person did subsistence activity last week, such as fishing, growing crops, etc., NOT primarily for commercial purposes. Mark (X) ONE box.

☐ Yes, worked for pay or profit; did NO subsistence activity
☐ Yes, worked for pay or profit AND did subsistence activity
☐ No, did NOT work for pay or profit; did subsistence activity → Skip to 27a
☐ No, did NOT work for pay or profit; did NO subsistence activity → Skip to 27a

- 24** At what location did this person work LAST WEEK? Do not include subsistence activity. If this person worked at more than one location, print where he or she worked most last week.

- a.** Name of island, U.S. state, commonwealth, territory, or foreign country

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- b.** Name of city, town, or village

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USE ONLY



Person 1 (continued)

- 25 a. How did this person usually get to work LAST WEEK?** *Do not include transportation to subsistence activity. If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

☐ Car, truck, or private van/bus
☐ Public van/bus
☐ Boat
☐ Taxicab
☐ Motorcycle
☐ Bicycle
☐ Walked
☐ Worked at home → *Skip to 29*
☐ Other method

- **If "Car, truck, or private van/bus" is marked in 25a, go to 25b. Otherwise, skip to 26a.**

- 25 b. How many people, including this person, usually rode to work in the car, truck, or private van/bus LAST WEEK?**

☐ Drove alone
☐ 2 people
☐ 3 people
☐ 4 people
☐ 5 or 6 people
☐ 7 or more people

- 26 a. What time did this person usually leave home to go to work LAST WEEK?**

: ☐ a.m. ☐ p.m.

- b. How many minutes did it usually take this person to get from home to work LAST WEEK?**

Minutes

- **Answer questions 27–28 for persons who did not work for pay or profit last week. Others skip to 29.**

- 27 a. LAST WEEK, was this person on layoff from a job?**

☐ Yes → *Skip to 27c*
☐ No

- b. LAST WEEK, was this person TEMPORARILY absent from a job or business?**

☐ Yes, on vacation, temporary illness, labor dispute, etc. → *Skip to 28*
☐ No → *Skip to 27d*

- c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?**

☐ Yes → *Skip to 27e*
☐ No

- 27 d. Has this person been looking for work during the last 4 weeks?**

☐ Yes
☐ No → *Skip to 28*

- e. LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?**

☐ Yes, could have gone to work
☐ No, because of own temporary illness
☐ No, because of all other reasons (*in school, etc.*)

- 28 When did this person last work, even for a few days?** *Do not include subsistence activity.*

☐ 2000
☐ 1999
☐ 1998
☐ 1995 to 1997
☐ 1990 to 1994 → *Skip to 33*
☐ 1989 or earlier → *Skip to 33*
☐ Never worked; or did subsistence only → *Skip to 33*

- 29 Industry or Employer** — *Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.*

- a. For whom did this person work?** *If now on active duty in the Armed Forces, mark (X) this box → and print the branch of the Armed Forces.*

Name of company, business, or other employer

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- b. What kind of business or industry was this?**

Describe the activity at location where employed. (For example: hospital, fish cannery, watchmaker, auto repair shop, bank)

- c. Is this mainly** — Mark (X) ONE box.

☐ Manufacturing?
☐ Wholesale trade?
☐ Retail trade?
☐ Other (*agriculture, construction, service, government, etc.*)?

Person 1 (continued)

33 g. Retirement, survivor, or disability pensions — Do NOT include Social Security.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

h. Any remittances — Include money from relatives outside the household or in the military.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

i. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

- ☐ Yes Annual amount — Dollars
\$, .00
- ☐ No

34 What was this person's total income in 1999? Add entries in questions 33a—33i; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

- Annual amount — Dollars
☐ None OR \$, .00 ☐ Loss

➔ Now, please answer questions 35—61 about your household.

35 Is this living quarters —

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent?

36 Which best describes this building? Include all apartments, flats, etc., even if vacant.

- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ Two houses — **Applies only in American Samoa**
- ☐ Three or more houses — **Applies only in American Samoa**
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 to 49 apartments
- ☐ A building with 50 or more apartments
- ☐ A container
- ☐ Boat, RV, van, etc.

37 About when was this building first built?

- ☐ 1999 or 2000 ☐ 1960 to 1969
- ☐ 1995 to 1998 ☐ 1950 to 1959
- ☐ 1990 to 1994 ☐ 1940 to 1949
- ☐ 1980 to 1989 ☐ 1939 or earlier
- ☐ 1970 to 1979

38 When did this person move into this living quarters?

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1969 or earlier

39 How many rooms do you have in this living quarters? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

- ☐ 1 room ☐ 6 rooms
- ☐ 2 rooms ☐ 7 rooms
- ☐ 3 rooms ☐ 8 rooms
- ☐ 4 rooms ☐ 9 or more rooms
- ☐ 5 rooms

40 How many bedrooms do you have; that is, how many bedrooms would you list if this living quarters were on the market for sale or rent?

- ☐ No bedroom
- ☐ 1 bedroom
- ☐ 2 bedrooms
- ☐ 3 bedrooms
- ☐ 4 bedrooms
- ☐ 5 or more bedrooms

41 a. Do you have hot and cold piped water?

- ☐ Yes, in this unit
- ☐ Yes, in this building, not in unit
- ☐ No, only cold piped water in this unit
- ☐ No, only cold piped water in this building
- ☐ No, only cold piped water outside this building
- ☐ No piped water

b. Do you have a bathtub or shower?

- ☐ Yes, in this unit
- ☐ Yes, in this building, not in unit
- ☐ Yes, outside this building
- ☐ No

Person 1 (continued)

41

c. Do you have a flush toilet?

- ☐ Yes, in this unit → *Skip to 42a*
- ☐ Yes, in this building, not in unit → *Skip to 42a*
- ☐ Yes, outside this building → *Skip to 42a*
- ☐ No

d. What type of toilet facilities do you have?

- ☐ Outhouse or privy
- ☐ Other or none

42

a. Are your MAIN cooking facilities located inside or outside this building?

- ☐ Inside this building
- ☐ Outside this building
- ☐ No cooking facilities → *Skip to 42c*

b. What type of cooking facilities are these?

- ☐ Electric stove
- ☐ Kerosene stove
- ☐ Gas stove
- ☐ Microwave oven and non-portable burners
- ☐ Microwave oven only
- ☐ Other (fireplace, hotplate, etc.)

c. Do you have a refrigerator in this building?

- ☐ Yes
- ☐ No

d. Do you have a sink with piped water in this building?

- ☐ Yes
- ☐ No

43

Is there telephone service available in this living quarters from which you can both make and receive calls?

- ☐ Yes
- ☐ No

44

Do you have air conditioning?

- ☐ Yes, a central air-conditioning system (includes split-type)
- ☐ Yes, 1 individual room unit
- ☐ Yes, 2 or more individual room units
- ☐ No

45

How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

- | | |
|-------------------------------|------------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 or more |
| <input type="checkbox"/> 3 | |

46

Do you have a battery operated radio? Count car radios, transistors, and other battery operated sets in working order or needing only a new battery for operation.

- ☐ Yes, 1 or more
- ☐ No

47

Do you get water from —

- ☐ A public system only?
- ☐ A public system and catchment?
- ☐ A village water system only? — *Applies only in American Samoa*
- ☐ An individual well?
- ☐ A catchment, tanks, or drums only?
- ☐ Some other source such as a standpipe, spring, river, creek, etc.?

48

Is this building connected to a public sewer?

- ☐ Yes, connected to public sewer
- ☐ No, connected to septic tank or cesspool
- ☐ No, use other means

49

Is this living quarters part of a condominium?

- ☐ Yes
- ☐ No

50

What is the MAIN type of material used for the outside walls of this building?

- ☐ Poured concrete
- ☐ Concrete blocks
- ☐ Metal
- ☐ Wood
- ☐ Other

51

What is the MAIN type of material used for the roof of this building?

- ☐ Poured concrete
- ☐ Metal
- ☐ Wood
- ☐ Other

52

What is the MAIN type of material used for the foundation of this building?

- ☐ Concrete
- ☐ Wood pier or pilings
- ☐ Other

53

Answer ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME — All others skip to 54a.

Is there a business (such as a store or shop) or a medical office on THIS property?

- ☐ Yes
- ☐ No

54

a. What is the average monthly cost for electricity for this living quarters?

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or electricity not used



Person 1 (continued)

- 54 b. What is the average monthly cost for gas for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or gas not used

- c. What is the average monthly cost for water and sewer for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge

- d. What is the average monthly cost for oil, coal, kerosene, wood, etc. for this living quarters?**

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or these fuels not used

- 55 a. Answer 55b ONLY if RENT IS PAID for this living quarters — All others skip to 56.**

- b. What is the monthly rent?**

Monthly amount — Dollars

\$, .00

- 56 Answer questions 56a—61 if you or someone in this household owns or is buying this living quarters; otherwise, skip to questions for Person 2.**

- a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?**

- ☐ Yes, mortgage, deed of trust, or similar debt
☐ Yes, contract to purchase
☐ No → Skip to 57a

- b. How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.**

Monthly amount — Dollars

\$, .00

OR

- ☐ No regular payment required → Skip to 57a

- c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?**

- ☐ Yes, taxes included in mortgage payment
☐ No, taxes paid separately or taxes not required

- 56 d. Does your regular monthly mortgage payment include payments for fire, hazard, typhoon, or flood insurance on THIS property?**

- ☐ Yes, insurance included in mortgage payment
☐ No, insurance paid separately or no insurance

- 57 a. Do you have a second mortgage or a home equity loan on THIS property? Mark ☒ all boxes that apply.**

- ☐ Yes, a second mortgage
☐ Yes, a home equity loan
☐ No → Skip to 58

- b. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?**

Monthly amount — Dollars

\$, .00

OR

- ☐ No regular payment required

- 58 What were the real estate taxes on THIS property last year?**

Yearly amount — Dollars

\$, .00

OR

- ☐ None

- 59 What was the annual payment for fire, hazard, typhoon, and flood insurance on THIS property?**

Annual amount — Dollars

\$, .00

OR

- ☐ None

- 60 What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?**

Value of property — Dollars

\$, , .00

- 61 Answer ONLY if this is a CONDOMINIUM — What is the monthly condominium fee?**

Monthly amount — Dollars


\$, .00

- Are there more people living here? If yes, continue with Person 2.**

Appendix J: U.S. Virgin Islands Census Form

**Census
2000**
U.S. Virgin
Islands

U.S. Department of Commerce
Bureau of the Census



This is the official form for all the people at this address. It is quick and easy, and your answers are protected by law. Complete the Census and help your community get what it needs — today and in the future!

Start Here



Please use a black or blue pen. Do NOT mail this form, your completed form will be picked up by a census worker.

1

How many people were living or staying in this house, apartment, or mobile home on April 1, 2000?

Number of people

INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2000 who have no other permanent place to stay
- people living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while attending college
- people in a correctional facility, nursing home, or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- people who live or stay at another place most of the time

➔

Please turn the page and print the names of all the people living or staying here on April 1, 2000.

Please fill out your form promptly. A census worker will visit your home to pick up your completed questionnaire or assist you if you have questions.

The Census Bureau estimates that, for the average household, this form will take about 40 minutes to complete, including the time for reviewing the instructions and answers. Comments about the estimate should be directed to the Associate Director for Finance and Administration, Attn: Paperwork Reduction Project 0607-0860, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget.

Form **D-13 VI**

OMB No. 0607-0860: Approval Expires 12/31/2000

List of Persons

➔ Please be sure you answered question 1 on the front page before continuing.

2 Please print the names of all the people who you indicated in question 1 were living or staying here on April 1, 2000.

Example — Last Name

J O H N S O N

First Name MI

R O B I N J

Start with the person, or one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here.

Person 1 — Last Name

First Name MI

Person 2 — Last Name

First Name MI

Person 3 — Last Name

First Name MI

Person 4 — Last Name

First Name MI

Person 5 — Last Name

First Name MI

Person 6 — Last Name

First Name MI

Person 7 — Last Name

First Name MI

Person 8 — Last Name

First Name MI

Person 9 — Last Name

First Name MI

Person 10 — Last Name

First Name MI

Person 11 — Last Name

First Name MI

Person 12 — Last Name

First Name MI

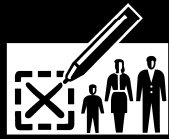
➔ Next, answer questions about Person 1.

Form D-13 VI

2

Person

1



Your answers are important!
Every person in the Census counts.

1 What is this person's name? *Print the name of Person 1 from page 2.*

Last Name

First Name

MI

2 What is this person's telephone number? *We may contact this person if we don't understand an answer.*
Area Code + Number

3 What is this person's sex? Mark ☒ ONE box.

- ☐ Male
☐ Female

4 What is this person's age and what is this person's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

→ **NOTE: Please answer BOTH Questions 5 and 6.**

5 Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ No, not Spanish/Hispanic/Latino
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latino — *Print group.* ↗

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6 What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↗

- ☐ Asian Indian
☐ Chinese
☐ Filipino
☐ Japanese
☐ Korean
☐ Vietnamese
☐ Other Asian — *Print race.* ↗
- ☐ Native Hawaiian
☐ Guamanian or Chamorro
☐ Samoan
☐ Other Pacific Islander — *Print race.* ↗

- ☐ Some other race — *Print race.* ↗

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7 What is this person's marital status?

- ☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married

8 a. At any time since February 1, 2000, has this person attended regular school or college? *Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.*

- ☐ No, has not attended since February 1 → *Skip to 9a*
☐ Yes, public school, public college
☐ Yes, private school, private college



Person 1 (continued)

- 8 b. What grade or level was this person attending?** Mark ☒ ONE box.
- ☐ Nursery school, preschool
☐ Kindergarten
☐ Grade 1 to grade 4
☐ Grade 5 to grade 8
☐ Grade 9 to grade 12
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school (for example: medical, dental, or law school)

- 9 a. What is the highest degree or level of school this person has COMPLETED?** Mark ☒ ONE box. If currently enrolled, mark the previous grade or highest degree received.

- ☐ No schooling completed
☐ Nursery school to 4th grade
☐ 5th grade or 6th grade
☐ 7th grade or 8th grade
☐ 9th grade
☐ 10th grade
☐ 11th grade
☐ 12th grade, **NO DIPLOMA**
☐ **HIGH SCHOOL GRADUATE** — high school DIPLOMA or the equivalent (for example: GED)
☐ Some college credit, but less than 1 year
☐ 1 or more years of college, no degree
☐ Associate degree (for example: AA, AS)
☐ Bachelor's degree (for example: BA, AB, BS)
☐ Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
☐ Professional degree (for example: MD, DDS, DVM, LLB, JD)
☐ Doctorate degree (for example: PhD, EdD)

b. Has this person completed the requirements for a vocational training program at a trade school, business school, hospital, some other kind of school for occupational training, or place of work? Do not include academic college courses.

- ☐ No
☐ Yes, in the U.S. Virgin Islands
☐ Yes, not in the U.S. Virgin Islands

- 10 a. Does this person speak a language other than English at home?**

- ☐ Yes
☐ No → Skip to 11

b. What is this language?

(For example: French, Spanish, Chinese, Italian)

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- 10 c. How well does this person speak English?**

- ☐ Very well
☐ Well
☐ Not well
☐ Not at all

- 11 Where was this person born?** Print St. Croix, St. John, or St. Thomas if in the U.S. Virgin Islands, or the name of the U.S. state, commonwealth, territory, or foreign country.

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- 12 Is this person a CITIZEN of the United States?**

- ☐ Yes, born in the U.S. Virgin Islands → Skip to 14a
☐ Yes, born in the United States, Puerto Rico, Guam, or Northern Mariana Islands
☐ Yes, born abroad of U.S. parent or parents
☐ Yes, a U.S. citizen by naturalization
☐ No, not a U.S. citizen (permanent resident)
☐ No, not a U.S. citizen (temporary resident)

- 13 When did this person come to the U.S. Virgin Islands to stay? If this person has entered the area more than once, what is the latest year?** Print numbers in boxes.

Year

- 14 a. Where was this person's mother born?** Print St. Croix, St. John, or St. Thomas if in the U.S. Virgin Islands, or the name of the U.S. state, commonwealth, territory, or foreign country.

FOR OFFICE
USE ONLY

b. Where was this person's father born? Print St. Croix, St. John, or St. Thomas if in the U.S. Virgin Islands, or the name of the U.S. state, commonwealth, territory, or foreign country.

FOR OFFICE
USE ONLY

- 15 a. Did this person live in this house or apartment 5 years ago (on April 1, 1995)?**

- ☐ Person is under 5 years old → Skip to 34
☐ Yes, this house → Skip to 16
☐ No, different house

Person 1 (continued)

23 At what location did this person work LAST WEEK?
If this person worked at more than one location, print where he or she worked most last week.

a. Name of the island in the U.S. Virgin Islands, or name of U.S. state, commonwealth, territory, or foreign country

b. Name of city, town, or village

24 a. How did this person usually get to work LAST WEEK? *If this person usually used more than one method of transportation during the trip, mark ☒ the box of the one used for most of the distance.*

- ☐ Car, truck, or van
- ☐ Bus
- ☐ Taxicab
- ☐ Motorcycle
- ☐ Safari or taxi bus
- ☐ Ferryboat or water taxi
- ☐ Walked
- ☐ Worked at home → *Skip to 28*
- ☐ Other method

➔ If "Car, truck, or van" is marked in 24a, go to 24b. Otherwise, skip to 25a.

24 b. How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

- ☐ Drove alone
- ☐ 2 people
- ☐ 3 people
- ☐ 4 people
- ☐ 5 or 6 people
- ☐ 7 or more people

25 a. What time did this person usually leave home to go to work LAST WEEK?

☐ a.m.

p.m.

b. How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes

➔ Answer questions 26–27 for persons who did not work for pay or profit last week. Others skip to 28.

26 a. LAST WEEK, was this person on layoff from a job?

- ☐ Yes → Skip to 26c
- ☐ No

b. LAST WEEK, was this person TEMPORARILY absent from a job or business?

- ☐ Yes, on vacation, temporary illness, labor dispute, etc. → *Skip to 27*
- ☐ No → *Skip to 26d*

c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?

- ☐ Yes → Skip to 26e
- ☐ No

d. Has this person been looking for work during the last 4 weeks?

- ☐ Yes
- ☐ No → *Skip to 27*

e. LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?

- ☐ Yes, could have gone to work
- ☐ No, because of own temporary illness
- ☐ No, because of all other reasons (*in school, etc.*)

27 When did this person last work, even for a few days?

- ☐ 1995 to 2000
- ☐ 1994 or earlier, or never worked → *Skip to 32*

28 Industry or Employer — Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give the information for his/her last job or business since 1995.

a. For whom did this person work? *If now on active duty in the Armed Forces, mark (X) this box →* ☒ *and print the branch of the Armed Forces.*

Name of company, business, or other employer

Person 1 (continued)

32 d. Social Security or Railroad Retirement

☐ Yes Annual amount — Dollars

\$, .00

☐ No

e. Supplemental Security Income (SSI)

☐ Yes Annual amount — Dollars

\$, .00

☐ No

f. Any public assistance or welfare payments from the state or local welfare office

☐ Yes Annual amount — Dollars

\$, .00

☐ No

g. Retirement, survivor, or disability pensions — Do NOT include Social Security.

☐ Yes Annual amount — Dollars

\$, .00

☐ No

h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony — Do NOT include lump-sum payments such as money from an inheritance or sale of a home.

☐ Yes Annual amount — Dollars

\$, .00

☐ No

33 What was this person's total income in 1999? Add entries in questions 32a—32h; subtract any losses. If net income was a loss, enter the amount and mark ☒ the "Loss" box next to the dollar amount.

Annual amount — Dollars

☐ None OR \$, .00 ☐ Loss

➔ Now, please answer questions 34—57 about your household.

34 Is this house, apartment, or mobile home —

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent?

35 Which best describes this building? Include all apartments, flats, etc., even if vacant.

- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 or more apartments
- ☐ A boat or houseboat
- ☐ RV, van, tent, etc.

36 About when was this building first built?

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1960 to 1969
- ☐ 1950 to 1959
- ☐ 1940 to 1949
- ☐ 1939 or earlier

37 When did this person move into this house, apartment, or mobile home?

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1969 or earlier

38 How many rooms do you have in this house, apartment, or mobile home? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

- | | |
|----------------------------------|--|
| <input type="checkbox"/> 1 room | <input type="checkbox"/> 6 rooms |
| <input type="checkbox"/> 2 rooms | <input type="checkbox"/> 7 rooms |
| <input type="checkbox"/> 3 rooms | <input type="checkbox"/> 8 rooms |
| <input type="checkbox"/> 4 rooms | <input type="checkbox"/> 9 or more rooms |
| <input type="checkbox"/> 5 rooms | |

39 How many bedrooms do you have; that is, how many bedrooms would you list if this house, apartment, or mobile home were on the market for sale or rent?

- ☐ No bedroom
- ☐ 1 bedroom
- ☐ 2 bedrooms
- ☐ 3 bedrooms
- ☐ 4 bedrooms
- ☐ 5 or more bedrooms

Person 1 (continued)

40 Do you have COMPLETE plumbing facilities in this house, apartment, or mobile home; that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

- ☐ Yes, have all three facilities
☐ No

41 Do you have COMPLETE kitchen facilities in this house, apartment, or mobile home; that is, 1) a sink with piped water, 2) a range or stove, and 3) a refrigerator?

- ☐ Yes, have all three facilities
☐ No

42 Is there telephone service available in this house, apartment, or mobile home from which you can both make and receive calls?

- ☐ Yes
☐ No

43 Which FUEL is used MOST for cooking in this house, apartment, or mobile home?

- ☐ Gas: bottled or tank
☐ Electricity
☐ Fuel oil, kerosene, etc.
☐ Wood or charcoal
☐ Other fuel
☐ No fuel used

44 How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

- ☐ None ☐ 4
☐ 1 ☐ 5
☐ 2 ☐ 6 or more
☐ 3

45 a. Do you get water from —

- ☐ A public system only?
☐ A public system and cistern?
☐ A cistern, tanks, or drums only?
☐ A public standpipe?
☐ Some other source such as an individual well or a spring?

b. Did you purchase any water from a water vendor during the past year?

- ☐ Yes
☐ No

46 Is this building connected to a public sewer?

- ☐ Yes, connected to public sewer
☐ No, connected to septic tank or cesspool
☐ No, use other means

47 Is this house, apartment, or mobile home part of a condominium?

- ☐ Yes
☐ No

48 Answer ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME — All others skip to 49.

a. Is there a business (such as a store or barber shop) or a medical office on this property?

- ☐ Yes
☐ No

b. How many acres is this house or mobile home on?

- ☐ Less than 1 acre
☐ 1 to 9.9 acres
☐ 10 or more acres

c. In 1999, what were the actual sales of all agricultural products from this property?

- ☐ None ☐ \$500 to \$999
☐ \$1 to \$99 ☐ \$1,000 to \$2,499
☐ \$100 to \$499 ☐ \$2,500 or more

49 a. What is the average monthly cost for electricity for this house, apartment, or mobile home?

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or electricity not used

b. What is the average monthly cost for gas for this house, apartment, or mobile home?

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or gas not used

c. What is the average monthly cost for water and sewer for this house, apartment, or mobile home?

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge

d. What is the average monthly cost for oil, coal, kerosene, wood, etc. for this house, apartment, or mobile home?

Average monthly cost — Dollars

\$, .00

OR

- ☐ Included in rent or in condominium fee
☐ No charge or these fuels not used



Person 1 (continued)

- 50** Answer **ONLY** if you **PAY RENT** for this house, apartment, or mobile home — All others skip to 51.

a. What is the monthly rent?

Monthly amount — *Dollars*

\$, .00

b. Does the monthly rent include any meals?

- ☐ Yes
☐ No

- 51** Answer questions 51a—57 if you or someone in this household owns or is buying this house, apartment, or mobile home; otherwise, skip to questions for Person 2.

a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?

- ☐ Yes, mortgage, deed of trust, or similar debt
☐ Yes, contract to purchase
☐ No → *Skip to 52a*

b. How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.

Monthly amount — *Dollars*

\$, .00

OR

- ☐ No regular payment required → *Skip to 52a*

c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?

- ☐ Yes, taxes included in mortgage payment
☐ No, taxes paid separately or taxes not required

d. Does your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

- ☐ Yes, insurance included in mortgage payment
☐ No, insurance paid separately or no insurance

- 52** **a. Do you have a second mortgage or a home equity loan on THIS property? Mark (X) all boxes that apply.**

- ☐ Yes, a second mortgage
☐ Yes, a home equity loan
☐ No → *Skip to 53*

b. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?

Monthly amount — *Dollars*

\$, .00

OR

- ☐ No regular payment required

- 53** What were the real estate taxes on THIS property last year?

Yearly amount — *Dollars*

\$, .00

OR

- ☐ None

- 54** What was the annual payment for fire, hazard, and flood insurance on THIS property?

Annual amount — *Dollars*

\$, .00

OR

- ☐ None

- 55** What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?

- | | |
|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$90,000 to \$99,999 |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$100,000 to \$124,999 |
| <input type="checkbox"/> \$15,000 to \$19,999 | <input type="checkbox"/> \$125,000 to \$149,999 |
| <input type="checkbox"/> \$20,000 to \$24,999 | <input type="checkbox"/> \$150,000 to \$174,999 |
| <input type="checkbox"/> \$25,000 to \$29,999 | <input type="checkbox"/> \$175,000 to \$199,999 |
| <input type="checkbox"/> \$30,000 to \$34,999 | <input type="checkbox"/> \$200,000 to \$249,999 |
| <input type="checkbox"/> \$35,000 to \$39,999 | <input type="checkbox"/> \$250,000 to \$299,999 |
| <input type="checkbox"/> \$40,000 to \$49,999 | <input type="checkbox"/> \$300,000 to \$399,999 |
| <input type="checkbox"/> \$50,000 to \$59,999 | <input type="checkbox"/> \$400,000 to \$499,999 |
| <input type="checkbox"/> \$60,000 to \$69,999 | <input type="checkbox"/> \$500,000 to \$749,999 |
| <input type="checkbox"/> \$70,000 to \$79,999 | <input type="checkbox"/> \$750,000 to \$999,999 |
| <input type="checkbox"/> \$80,000 to \$89,999 | <input type="checkbox"/> \$1,000,000 or more |

- 56** Answer **ONLY** if this is a **CONDOMINIUM** —

What is the monthly condominium fee?

Monthly amount — *Dollars*

\$, .00

- 57** Answer **ONLY** if this is a **MOBILE HOME** or a **BOAT** —

a. Do you have an installment loan or contract on THIS mobile home or boat?

- ☐ Yes
☐ No

b. What was the total cost for installment loan payments, personal property taxes, site rent, marina fee, registration fees, and license fees on THIS mobile home or boat and its site/slip last year? Exclude real estate taxes.

Yearly amount — *Dollars*


\$, .00

- Are there more people living here? If yes, continue with Person 2.

Appendix K: Puerto Rico Census Form

Censo 2000 Puerto Rico

Departamento de Comercio de los EE.UU.
Negociado del Censo



Este es el cuestionario oficial para todas las personas en esta dirección. Es rápido y fácil de contestar, y la ley protege sus respuestas. ¡Complete el censo y ayude a su comunidad a conseguir lo que necesita, hoy y en el futuro!

Comience Aquí

Por favor, utilice un bolígrafo de tinta negra o azul.

1 ¿Cuántas personas vivían o se quedaban en esta casa, apartamento o casa móvil el 1 de abril del 2000?

Número de personas

INCLUYA en este número:

- hijos de crianza, inquilinos o compañeros de casa
- personas que se estén quedando aquí el 1 de abril del 2000, y no tienen otro lugar permanente donde quedarse
- personas que se estén quedando aquí la mayor parte del tiempo mientras trabajan aunque tengan otro lugar donde vivir

NO INCLUYA en este número:

- estudiantes universitarios que viven fuera del hogar mientras asisten a la universidad
- personas que estaban en una facilidad de corrección, hogar para personas de edad avanzada, u hospital para enfermos mentales el 1 de abril del 2000
- personal de las Fuerzas Armadas que vive en otro lugar
- personas que viven o se quedan en otro lugar la mayor parte del tiempo

2 Refiérase a la etiqueta de dirección en esta página. Si esa dirección NO es la dirección POSTAL de esta residencia, escriba a continuación la dirección postal en letra de molde.

Número de casa

Nombre de urbanización o condominio

Nombre de calle o carretera/ruta y buzón rural o apartado postal

Número de apartamento

Ciudad

Estado

Código Postal (ZIP Code)

➔ Por favor, pase la página y escriba en letra de molde los nombres de todas las personas que estén viviendo o quedándose aquí el 1 de abril del 2000.

Si necesita ayuda para completar este cuestionario, llame al 1-800-471-8642 entre las 8:00 a.m. y las 9:00 p.m., 7 días a la semana. La llamada telefónica es gratis.

TDD - Aparato telefónico para las personas con impedimentos auditivos. Llame al 1-800-582-8330 entre las 8:00 a.m. y las 9:00 p.m., 7 días a la semana. La llamada telefónica es gratis.

NEED HELP? If you need help completing this form, call 1-800-471-9424 between 8:00 a.m. and 9:00 p.m., 7 days a week. The telephone call is free.

Núm. de OMB 0607-0858: Aprobado Hasta 12/31/2000

Forma **D-2(UL)PR(S)**

Lista de Personas

➔ Por favor, asegúrese de que contestó la pregunta en la primera página antes de continuar.

3 Por favor, anote los nombres de todas las personas que usted indicó en la pregunta 2 que vivían o se quedaban aquí el 1 de abril del 2000.

Ejemplo — Apellido

J I M E N E Z
Nombre Inicial
E N R I Q U E J

Comience con la persona, o una de las personas, que vive aquí que es dueña, está comprando o alquila esta casa apartamento, o casa móvil. Si no hay tal persona, comience con un adulto que vive o se queda aquí.

Persona 1 — Apellido

Nombre Inicial

Persona 2 — Apellido

Nombre Inicial

Persona 3 — Apellido

Nombre Inicial

Persona 4 — Apellido

Nombre Inicial

Persona 5 — Apellido

Nombre Inicial

Persona 6 — Apellido

Nombre Inicial

Persona 7 — Apellido

Nombre Inicial

Persona 8 — Apellido

Nombre Inicial

Persona 9 — Apellido

Nombre Inicial

Persona 10 — Apellido

Nombre Inicial

Persona 11 — Apellido

Nombre Inicial

Persona 12 — Apellido

Nombre Inicial

➔ Ahora, conteste las preguntas sobre la Persona 1.

El Negociado del Censo estima que al hogar típico en Puerto Rico le tomará aproximadamente 48 minutos completar este cuestionario, incluyendo el tiempo para repasar las instrucciones y respuestas. Los comentarios sobre el estimado deben dirigirse a: Associate Director for Finance and Administration, Attn: Paperwork Reduction Project 0607-0858, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233.

No se requiere que las personas respondan a ninguna recopilación de información a menos que ésta tenga un número de aprobación válido de la Oficina de Administración y Presupuesto (OMB).

PARA USO DEL CENSO SOLAMENTE

A. JIC1

B. JIC2

C. JIC3

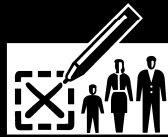
D. JIC4

Forma D-2(UL)PR(S)

2

Persona

1



**¡Sus respuestas
son importantes!
Cada persona cuenta
en el censo.**

1 ¿Cuál es el nombre de esta persona? *Escriba en letra de molde el nombre de la Persona 1 que aparece en la página 2.*

Apellido

Nombre

Inicial

2 ¿Cuál es el número de teléfono de esta persona? *Puede que llamemos a esta persona si no entendemos una respuesta.*

Código de Área + Número

3 ¿Cuál es el sexo de esta persona? Marque ☒ UN cuadrado.

☐ Masculino

☐ Femenino

4 ¿Cuál es la edad de esta persona y cuál es su fecha de nacimiento?

Edad el 1 de abril del 2000

Escriba los números en los cuadrados.

Mes Día Año de nacimiento

➔ **NOTA:** Por favor conteste las DOS Preguntas 5 y 6.

5 ¿Es esta persona de origen español/hispano/latino?

Marque ☒ el cuadrado "No" si **no** es de origen español/hispano/latino.

☐ No, ni español/hispano/latino

☐ Sí, mexicano, mexicano-americano, chicano

☐ Sí, puertorriqueño

☐ Sí, cubano

☐ Sí, otro grupo español/hispano/latino — *Escriba el grupo en letra de molde.* ➔

6 ¿Cuál es la raza de esta persona? Marque ☒ una o más razas para indicar de qué raza se considera esta persona.

☐ Blanca

☐ Negra, africana americana

☐ India americana o nativa de Alaska — *Escriba en letra de molde el nombre de la tribu en la cual está inscrita o la tribu principal.* ➔

☐ India asiática

☐ China

☐ Filipina

☐ Japonesa

☐ Coreana

☐ Vietnamita

☐ Otra asiática — *Escriba la raza en letra de molde.* ➔

☐ Nativa de Hawaii

☐ Guameña o Chamorro

☐ Samoana

☐ Otra de las islas del Pacífico — *Escriba la raza en letra de molde.* ➔

☐ alguna otra raza — *Escriba la raza en letra de molde.* ➔

7 ¿Cuál es el estado civil de esta persona?

☐ Casada actualmente

☐ Viuda

☐ Divorciada

☐ Separada

☐ Nunca se ha casado

8 a. En cualquier momento desde el 1 de febrero del 2000, ¿ha asistido esta persona a una escuela regular o universidad? *Incluya sólo guardería infantil (nursery school) o prekindergarten, kindergarten, escuela primaria o educación que conduce a un diploma de escuela secundaria (high school) o título universitario.*

☐ No, no ha asistido desde el 1ro. de febrero — *Pase a la pregunta 9*

☐ Sí, escuela pública, universidad pública

☐ Sí, escuela privada, universidad privada



b. ¿A qué grado o nivel escolar asistía esta persona?
 Marque ☒ UN cuadrado.

☐ Guardería infantil (*nursery school*), prekindergarten

☐ Kindergarten

☐ Grado 1 al 4

☐ Grado 5 al 8

☐ Grado 9 al 12

☐ Estudios universitarios a nivel de bachillerato (*freshman a senior*)

☐ Escuela graduada o profesional (por ejemplo, escuela de medicina, de odontología, o de leyes)

- 9 ¿Cuál es el título o nivel escolar más alto que esta persona ha COMPLETADO? Marque ☒ UN cuadrado. Si está matriculada actualmente, marque el grado escolar anterior o el título más alto recibido.
- ☐ No ha completado ningún grado
- ☐ Guardería infantil (*nursery school*) a 4to. grado
- ☐ 5to. ó 6to. grado
- ☐ 7mo. u 8vo. grado
- ☐ 9no. grado
- ☐ 10mo. grado
- ☐ 11mo. grado
- ☐ 12mo. grado, **SIN DIPLOMA**
- ☐ **GRADUADA DE ESCUELA SECUNDARIA (HIGH SCHOOL)** — DIPLOMA de escuela secundaria o su equivalente (por ejemplo: GED)
- ☐ Algunos créditos universitarios, pero menos de 1 año
- ☐ 1 año o más de universidad, sin título
- ☐ Título asociado universitario (por ejemplo: AA, AS)
- ☐ Título de bachiller universitario (por ejemplo: BA, AB, BS)
- ☐ Título de maestría (por ejemplo: MA, MS, MEng, MEd, MSW, MBA)
- ☐ Título profesional (por ejemplo: MD, DDS, DVM, LLB, JD)
- ☐ Título de doctorado (por ejemplo: PhD, EdD)

(Por ejemplo: italiana, jamaicana, africana americana, camboyana, de Cabo Verde, noruega, dominicana, franco-canadiense, haitiana, coreana, libanesa, polaca, nigeriana, mexicana, taiwanesa, ucraniana, y así por el estilo.)

- 11** a. ¿Habla esta persona en su hogar un idioma que no sea inglés?
- ☐ Sí
- ☐ No → *Pase a la pregunta 12*

(Por ejemplo: coreano, italiano, español, vietnamés)

(Por ejemplo: coreano, italiano, español, vietnamés)

☐ Muy bien

☐ Bien

☐ No bien

☐ No habla inglés

☐ En los Estados Unidos — *Escriba en letra de molde el nombre del estado.*

☐ Fuera de los Estados Unidos — *Escriba en letra de molde Puerto Rico o el nombre del país extranjero, de las Islas Vírgenes de los EE.UU., Guam, etc.*

☐ Sí, nació en Puerto Rico → *Pase a la pregunta 15a*

☐ Sí, nació en un estado de los Estados Unidos, el Distrito de Columbia, Guam, las Islas Vírgenes de los Estados Unidos, o las Islas Marianas del Norte

☐ Sí, nació en el extranjero de padre o madre americano(a)

☐ Sí, es ciudadana de los Estados Unidos por naturalización

☐ No, no es ciudadana de los Estados Unidos

Escriba los números en los cuadrados.

Año

☐ Persona es menor de 5 años de edad – *Pase a la pregunta 33*

☐ Sí, en esta casa → *Pase a la pregunta 16*

☐ No, fuera de Puerto Rico o los Estados Unidos – *Escriba en letra de molde a continuación el nombre del país extranjero, o las Islas Virgenes de los Estados Unidos, Guam, etc.; luego pase a la pregunta 16.*

☐ No, en casa diferente en Puerto Rico o en los Estados Unidos

Persona 1 (continuación)

15 b. ¿Dónde vivía esta persona hace 5 años?

Nombre de la ciudad, pueblo, u oficina postal

¿Vivía esta persona dentro de los límites de esta ciudad o pueblo?

☐ Sí

☐ No, fuera de los límites de la ciudad/pueblo

Nombre del municipio o condado de los Estados Unidos

Anote Puerto Rico o el nombre del estado de los Estados Unidos

Código Postal (ZIP Code)

16 ¿Tiene esta persona algunas de las siguientes condiciones de larga duración —

a. Ceguera, sordera, o impedimento visual o auditivo grave?

Sí

No

☐
☐

b. Una condición que limita sustancialmente una o más actividades físicas básicas tales como caminar, subir escaleras, estirarse, levantar, o cargar?

☐
☐

17 Debido a una condición física, mental o emocional que ha durado 6 meses o más, ¿tiene esta persona alguna dificultad en llevar a cabo algunas de las siguientes actividades —

Sí

No

a. Aprender, recordar, o concentrarse?

☐
☐

b. Vestirse, bañarse, y caminar por la casa sin ayuda de otra persona?

☐
☐

c. (Conteste si la persona tiene 16 AÑOS O MÁS) Salir sola de compras o ir sola al médico?

☐
☐

d. (Conteste si la persona tiene 16 AÑOS O MÁS) Trabajar en un empleo o negocio?

☐
☐

18 ¿Era esta persona menor de 15 años el 1 de abril del 2000?

☐ Sí → Pase a la pregunta 33

☐ No

19 a. ¿Tiene esta persona algún nieto menor de 18 años que viva en esta casa o apartamento?

☐ Sí

☐ No → Pase a la pregunta 20a

b. ¿Es este(a) abuelo(a) actualmente responsable de la mayoría de las necesidades básicas de algunos de sus nietos menores de 18 años que viven en esta casa o apartamento?

☐ Sí

☐ No → Pase a la pregunta 20a

c. ¿Cuánto tiempo hace que este(a) abuelo(a) es responsable de este(os) nieto(s)? Si este(a) abuelo(a) es responsable económicamente de más de un nieto, conteste la pregunta para el nieto del cual haya sido responsable por más tiempo.

☐ Menos de 6 meses

☐ 6 a 11 meses

☐ 1 ó 2 años

☐ 3 ó 4 años

☐ 5 años o más

20 a. ¿Ha estado esta persona alguna vez en servicio militar activo en las Fuerzas Armadas, la Reserva militar, o la Guardia Nacional de los Estados Unidos? El servicio activo no incluye adiestramiento para la Reserva militar, o la Guardia Nacional, pero Sí incluye servicio activo, por ejemplo, en la Guerra del Golfo Pérsico.

☐ Sí, ahora en servicio activo

☐ Sí, en servicio activo en el pasado, pero no ahora

☐ No, adiestramiento para la Reserva o la Guardia Nacional solamente → Pase a la pregunta 21

☐ No, nunca estuvo en servicio militar → Pase a la pregunta 21

b. ¿Cuándo estuvo esta persona en servicio activo en las Fuerzas Armadas de los Estados Unidos? Marque ☒ un cuadrado por CADA período durante el cual esta persona estuvo en servicio militar.

☐ Abril del 1995 o después

☐ Agosto del 1990 a marzo del 1995 (incluyendo la Guerra del Golfo Pérsico)

☐ Septiembre del 1980 a julio del 1990

☐ Mayo del 1975 a agosto del 1980

☐ Época de Vietnam (agosto del 1964–abril del 1975)

☐ Febrero del 1955 a julio del 1964

☐ Conflicto de Corea (junio del 1950–enero del 1955)

☐ Segunda Guerra Mundial (septiembre del 1940–julio del 1947)

☐ Algún otro período

c. En total, ¿cuántos años estuvo esta persona en servicio militar activo?

☐ Menos de 2 años

☐ 2 años o más



Persona 1 (continuación)

38 ¿Cuántos dormitorios hay, es decir, cuántos dormitorios indicaría que tiene esta casa, apartamento, o casa móvil si estuviera para el alquiler o la venta?

- ☐ Ningún dormitorio
☐ 1 dormitorio
☐ 2 dormitorios
☐ 3 dormitorios
☐ 4 dormitorios
☐ 5 dormitorios o más

39 ¿Tiene usted facilidades sanitarias COMPLETAS en esta casa, apartamento, o casa móvil; es decir, 1) agua caliente y fría por tubería, 2) un inodoro, y 3) una bañera o ducha?

- ☐ Sí, tiene las tres facilidades
☐ No

40 ¿Tiene usted facilidades COMPLETAS de cocina en esta casa, apartamento, o casa móvil; es decir, 1) un fregadero con agua por tubería, 2) una estufa, y 3) un refrigerador?

- ☐ Sí, tiene las tres facilidades
☐ No

41 ¿Hay servicio telefónico disponible en esta casa, apartamento, o casa móvil del cual usted puede hacer y recibir llamadas?

- ☐ Sí
☐ No

42 ¿Cuál COMBUSTIBLE es el que MÁS se utiliza para calentar esta casa, apartamento, o casa móvil?

- ☐ Gas de una tubería subterránea que sirve al vecindario
☐ Gas embotellado, en tanque, o LP
☐ Electricidad
☐ Aceite combustible, queroseno, etc.
☐ Carbón o coque
☐ Leña
☐ Energía solar
☐ Otro combustible
☐ No se utiliza combustible

43 ¿Cuántos automóviles, vans o camiones con capacidad para una carga de una tonelada o menos se guardan en la casa para uso de los miembros de su hogar?

- ☐ Ninguno
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6 ó más

44 Conteste SÓLO si ésta es UNA CASA PARA UNA SOLA FAMILIA O CASA MÓVIL — Todos los otros pasen a la pregunta 45.

a. ¿Hay un negocio (tal como una tienda o barbería) u oficina médica en esta propiedad?

- ☐ Sí
☐ No

b. ¿En cuántas cuerdas está situada esta casa o casa móvil?

- ☐ Menos de una cuerda → Pase a la pregunta 45
☐ 1 a 9.9 cuerdas
☐ 10 cuerdas o más

c. En 1999, ¿cuánto fue el total de las ventas realizadas de todos los productos agrícolas de esta propiedad?

- | | |
|--|--|
| <input type="checkbox"/> Cero | <input type="checkbox"/> \$2,500 a \$4,999 |
| <input type="checkbox"/> \$1 a \$999 | <input type="checkbox"/> \$5,000 a \$9,999 |
| <input type="checkbox"/> \$1,000 a \$2,499 | <input type="checkbox"/> \$10,000 ó más |

45 ¿Cuántos son los costos anuales de los servicios públicos y combustible para esta casa, apartamento, o casa móvil? Si usted ha vivido aquí menos de un año, estime el costo anual.

a. Electricidad

Costo anual — Dólares

\$, .00

ó

- ☐ Incluido en el alquiler o cuota de condominio
☐ No hay cargo o no se utiliza electricidad

b. Gas

Costo anual — Dólares

\$, .00

ó

- ☐ Incluido en el alquiler o cuota de condominio
☐ No hay cargo o no se utiliza gas

c. Agua y alcantarillado

Costo anual — Dólares

\$, .00

ó

- ☐ Incluido en el alquiler o cuota de condominio
☐ No hay cargo

d. Aceite, coque, queroseno, leña, etc.

Costo anual — Dólares

\$, .00

ó

- ☐ Incluido en el alquiler o cuota de condominio
☐ No hay cargo o no se utilizan estos combustibles



Persona 1 (continuación)

46 Conteste SÓLO si PAGA ALQUILER por esta casa, apartamento, o casa móvil — De lo contrario, pase a la Pregunta 47.

a. ¿Cuál es el alquiler mensual?

Cantidad mensual — Dólares

\$ | | , | | .00

b. ¿Incluye el alquiler mensual algunas comidas?

- ☐ Sí
☐ No

47 Conteste las preguntas 47a—53 si usted o alguien en este hogar es dueño o está comprando esta casa, apartamento, o casa móvil; de lo contrario, pase a las preguntas para la Persona 2.

a. ¿Tiene usted una hipoteca, contrato de compra, escritura de fideicomiso o deuda similar sobre ESTA propiedad?

- ☐ Sí, hipoteca, escritura de fideicomiso, o deuda similar
☐ Sí, contrato de compra
☐ No → Pase a la pregunta 48a

b. ¿Cuánto es su pago mensual regular de la hipoteca sobre ESTA propiedad? Incluya sólo el pago de la primera hipoteca o contrato de compra.

Cantidad mensual — Dólares

\$ | | , | | .00
ó

☐ No se requiere ningún pago regular → Pase a la pregunta 48a

c. ¿Incluye su pago mensual regular de la hipoteca los pagos de impuestos sobre bienes raíces para ESTA propiedad?

- ☐ Sí, se incluyen los impuestos en el pago de la hipoteca
☐ No, los impuestos se pagan por separado o no se requieren impuestos

d. ¿Incluye su pago mensual regular de la hipoteca los pagos de la prima por concepto de seguro contra incendios, riesgos, e inundaciones para ESTA propiedad?

- ☐ Sí, se incluye el seguro en el pago de la hipoteca
☐ No, el seguro se paga por separado, o no se tiene seguro

48 a. ¿Tiene usted una segunda hipoteca o un préstamo sobre el valor líquido de ESTA propiedad (Home Equity Loan)? Marque (X) todos los cuadrados que aplican.

- ☐ Sí, una segunda hipoteca
☐ Sí, un préstamo sobre el valor líquido de esta propiedad
☐ No → Pase a la pregunta 49

b. ¿Cuánto es su pago mensual regular de todas las segundas hipotecas y todos los préstamos sobre el valor líquido de ESTA propiedad?

Cantidad mensual — Dólares

\$ | | , | | .00
ó

☐ No se requiere ningún pago regular

49 ¿Cuánto fue el total de los impuestos de bienes raíces sobre ESTA propiedad el año pasado?

Cantidad anual — Dólares

\$ | | , | | .00
ó

☐ Nada

50 ¿Cuánto fue el pago anual de la prima por concepto de seguro contra incendios, riesgos, e inundaciones para ESTA propiedad?

Cantidad anual — Dólares

\$ | | , | | .00
ó

☐ Nada

51 ¿Cuál es el valor de esta propiedad, es decir, por cuánto cree usted que se vendería esta casa y el terreno, apartamento, o casa móvil y el lote si estuviera para la venta?

- | | |
|--|--|
| <input type="checkbox"/> Menos de \$10,000 | <input type="checkbox"/> \$90,000 a \$99,999 |
| <input type="checkbox"/> \$10,000 a \$14,999 | <input type="checkbox"/> \$100,000 a \$124,999 |
| <input type="checkbox"/> \$15,000 a \$19,999 | <input type="checkbox"/> \$125,000 a \$149,999 |
| <input type="checkbox"/> \$20,000 a \$24,999 | <input type="checkbox"/> \$150,000 a \$174,999 |
| <input type="checkbox"/> \$25,000 a \$29,999 | <input type="checkbox"/> \$175,000 a \$199,999 |
| <input type="checkbox"/> \$30,000 a \$34,999 | <input type="checkbox"/> \$200,000 a \$249,999 |
| <input type="checkbox"/> \$35,000 a \$39,999 | <input type="checkbox"/> \$250,000 a \$299,999 |
| <input type="checkbox"/> \$40,000 a \$49,999 | <input type="checkbox"/> \$300,000 a \$399,999 |
| <input type="checkbox"/> \$50,000 a \$59,999 | <input type="checkbox"/> \$400,000 a \$499,999 |
| <input type="checkbox"/> \$60,000 a \$69,999 | <input type="checkbox"/> \$500,000 a \$749,999 |
| <input type="checkbox"/> \$70,000 a \$79,999 | <input type="checkbox"/> \$750,000 a \$999,999 |
| <input type="checkbox"/> \$80,000 a \$89,999 | <input type="checkbox"/> \$1,000,000 ó más |

52 Conteste SÓLO si éste es un CONDOMINIO —

¿Cuánto es la cuota mensual de condominio?

Cantidad mensual — Dólares

\$ | | , | | .00

53 Conteste SÓLO si ésta es una CASA MÓVIL —

a. ¿Tiene usted un préstamo a plazos o contrato sobre ESTA casa móvil?

- ☐ Sí
☐ No

b. ¿Cuánto fue el costo total de los pagos del préstamo a plazos, impuestos sobre bienes muebles, renta del lote, cuotas de registro, y cuotas de licencia para ESTA casa móvil y su lote el año pasado? Excluya los impuestos sobre bienes raíces.

Cantidad anual — Dólares

\$ | | , | | .00

→ ¿Viven más personas aquí? Si contesta que sí, continúe con la Persona 2.

Census 2000 Glossary

Term	Abbrevia- tion	Description
100 percent census edited file	HCEF	A computer file that contains the edited characteristics and records for all households and people in Census 2000. The edits are performed on the 100 percent census unedited file. The edits include consistency edits and imputation for items or people where the data are insufficient for the 100 percent data items from both the short- and long-form questionnaires. The HCEF provided the census counts for apportionment purposes.
100 percent census unedited file	HCUF	The decennial response file was combined with the decennial master address file to create the HCUF and sample census unedited file. The HCUF contains the unedited individual responses to the 100 percent data items from both the Census 2000 short- and long-form questionnaires.
100 percent data		Population and housing information collected for all living quarters in the United States. See long form, sample data, short form.
100 percent detail file	HDF	A file resulting from the application of disclosure avoidance and tabulation geography to the 100 percent census edited file. This file was used to produce Census 2000 data products and other tabulations based on the 100 percent items.
A Streamlined Acquisition Process	ASAP	The Census Bureau process to acquire services. There are six phases: (1) bureau integrated strategic planning and budgeting, (2) project planning, (3) market research, (4) selection acquisition vehicle, (5) meet project objective and manage acquisition, and (6) closeout.
Accuracy and Coverage Evaluation	A.C.E.	A coverage measurement methodology used to determine the number of people and housing units missed or counted more than once in Census 2000.
active entity		A governmental unit that has elected or appointed officials who carry out legally prescribed functions, provide services, and/or raise revenues. The Census Bureau differentiates active entities by their fiscal independence and whether they provide general or limited special services. See functional status, functioning entity, governmental unit, inactive entity, nonfunctioning entity.
address		The house number and street name or other designation assigned to a housing unit, special place, business establishment, or other structure for purposes of mail delivery or to allow emergency services, delivery people, and visitors to find the structure. See basic street address, city-style address, E-911 address, fire number, house number and street name address, location description, mailing address, non-city-style address.
address break		The city-style address on each side of a legal boundary; for example, 1234 Main Street is inside an incorporated place and 1236 is outside the place.
address coding guide	ACG	A forerunner of the Geographic Base File/Dual Independent Map Encoding file and TIGER® file.

Term	Abbreviation	Description
address control file	ACF	The 1990 residential address list used to label questionnaires, control the mail response check-in operation, and determine the nonresponse follow-up workload. See master address file.
Address List Review Program and Address List Map Review Program	ALR ALMR	Also called Local Update of Census Addresses. Census 2000 programs, established in response to requirements of Public Law 103-430, that provided an opportunity for local and tribal governments to review and update individual address information in the master address file and associated geographic information in the TIGER® database to improve the completeness and accuracy of both computer files. The governments signed a confidentiality agreement to participate.
address listing	AL	A field operation to develop the Census 2000 address list in areas of predominantly non-city-style addresses. The lister enters, in an address register, all mailing addresses and/or physical locations for all places within a specified area. The lister marks the location of each residential structure on an assignment area block map by drawing a map spot and assigning a map spot number. The lister also updates and corrects the map if necessary.
address range		The lowest and highest house numbers along each side of a street segment that has city-style addresses. The U.S. Census Bureau usually expands the range to include all possible numbers, not just the existing ones (for example, the Census Bureau expands the actual addresses of 105–131 on the odd-numbered side of the 100 block of a street to 101–199). Usually an address range on one side of a street contains only even or only odd numbers, but sometimes one or both sides contain both.
address register	AR	A book used by field staff to record or verify addresses and related information for all living quarters in an assignment area. It also includes: (1) instructions on how to perform the job and (2) a set of maps for the assigned area.
address register area	ARA	Term used in 1990. Now called an assignment area.
addressable feature		A physical feature along which living quarters can be constructed and assigned an address. Usually, this is a road or street, but it could also be an alley, driveway, and occasionally an unusual feature such as a railroad track or navigable stream.
Advance Census Report	ACR	In previous censuses, an unaddressed, short-form questionnaire delivered by U.S. Postal Service letter carriers in advance of the actual enumeration in list/enumerate areas. Enumerators picked up any completed ACRs, checked them for completeness and consistency, transferred the responses to standard census questionnaires, and completed any missing information. Used only in the Island Areas for Census 2000.
advance notice letter/reminder card	ANL/RC	Part of the questionnaire mailing strategy. ANL: In every area except list/enumerate, the Census Bureau sends an advance notice letter to every mailout address to alert households that the census form will be sent soon. RC: A postcard sent to addresses on the decennial master address file to remind respondents to return their census questionnaires or to thank them if they already have. All addresses in mailout/mailback areas receive a postcard. The Census Bureau blanket-mails these postcards to postal patrons (no addresses) in update/leave areas.
Advance Post Office Check	APOC	Obsolete term. See postal validation check.

Term	Abbreviation	Description
Alaska Native Claims Settlement Act	ANCSA	Legislation (Public Law 92-203) enacted in 1972 establishing the Alaska Native Regional Corporations and Alaska Native Villages to conduct business and nonprofit activities by and for Alaska Natives.
Alaska Native Regional Corporation	ANRC	A corporate entity organized to conduct both business and nonprofit affairs of Alaska Natives pursuant to the Alaska Native Claims Settlement Act.
Alaska Native Village	ANV	A type of local governmental unit in Alaska that constitutes an association, band, clan, community, group, tribe, or village recognized pursuant to the Alaska Native Claims Settlement Act. ANVs do not have legally defined boundaries. See Alaska Native Village statistical area, governmental unit, legal entity.
Alaska Native Village statistical area	ANVSA	A decennial census statistical area that represents the geographic jurisdiction of an Alaska Native Village (ANV) as established for the Census Bureau by officials of the ANV and its Alaska Native Regional Corporation for the purpose of presenting census data.
American Community Survey	ACS	A monthly sample household survey similar to the long-form census questionnaire. It was first tested in 1996 and is expected to replace the long form for the 2010 Census. Beginning in 2003, the nationwide monthly sample survey provides annual data for social, economic, and housing characteristics. At first, the data will be available for states, cities, counties, and metropolitan areas with a minimum population of 250,000; then, in 2004, a minimum population of 65,000; and in 2008, small geographic entities.
American FactFinder	AFF	A generalized electronic system for access and dissemination of Census Bureau data. The system is available through the Internet and offers prepackaged data products and the ability to build custom products. The system serves as the vehicle for accessing and disseminating data from Census 2000 (as well as the 1997 Economic Censuses and the American Community Survey). The system was formerly known as the Data Access and Dissemination System (DADS).
American Indian and Alaska Native area	AIANA	A Census Bureau term referring to these entity types: American Indian reservation, American Indian subreservation area, American Indian trust lands, state designated American Indian statistical area, tribal jurisdictional statistical area, tribal designated statistical area, tribal subdivision, Alaska Native Regional Corporation, Alaska Native Village, or Alaska Native Village statistical area.
American Indian area	AIA	A generic Census Bureau grouping that includes reference to any or all of the following areas: American Indian reservation, American Indian trust lands, tribal jurisdiction statistical area, or tribal designated statistical area.
American Indian area/Alaska Native area/Hawaiian Home Lands	AIANHH	An all-encompassing Census Bureau term referring to American Indian entities, Alaska Native entities, and Hawaiian Home Lands. See American Indian and Alaska Native area, Hawaiian Home Lands.
American Indian reservation		An American Indian geographic entity with boundaries established by treaty, statute, or executive or court order. Federal and some state governments have established reservations as territory over which American Indians have governmental jurisdiction. These entities are designated as colonies, communities, pueblos, rancherias, reservations, and reserves. See American Indian and Alaska Native area, governmental unit, legal entity.

Term	Abbreviation	Description
American Indian tribal subdivision		An administrative subdivision of an American Indian reservation. Tribal subdivisions may extend beyond the boundary of their reservations. These entities are internal units of self-government or administration that serve social, cultural, or economic purposes for the American Indians living on and adjacent to the reservation.
American Indian trust land	TL	Land held in trust by the federal government for either a tribe (tribal trust land) or an individual member of a tribe (individual trust land). Such land always is associated with a specific federally recognized reservation or tribe but may be located on or off the reservation. The Census Bureau recognizes and tabulates data separately only for off-reservation trust lands. See American Indian reservation, Hawaiian Home Lands.
apportionment		The number of representatives that a state is entitled to in the U.S. House of Representatives based on the decennial census. See reapportionment, redistricting.
assignment area	AA	A geographic area established by the Census Bureau for a specific field operation for the census. An AA consists of one or more census blocks for most operations and is assigned to a single enumerator, lister, or other field staff to obtain information about the residents and living quarters within the boundaries of the AA. Formerly called an address register area and an enumeration district. See assignment area map, collection geography.
assignment area map	AA map	A map that shows the area assigned to a member of the field staff for a specific census operation. The map displays the individual roads, streets, and nonstreet features (and their names, if any) in and adjacent to the assignment area (AA), and, if appropriate, the city-style address ranges of the roads and streets or the census collection block numbers within the AA. See assignment area, block map, collection block, locator map.
assignment control		For all field operations, clerks check the accuracy and completeness of work returned from the field to the local census office. This procedure takes on critical importance for nonresponse follow-up and list/enumerate.
assignment preparation		The coordination, preparation, and assembly of all materials, including maps, registers, and questionnaires, by assignment area. This operation is performed at the regional census centers for address listing and block canvassing and at the local census offices for other field operations. Map pouch labels and maps are printed in the regional census centers.
Asynchronous Transfer Mode	ATM	A process that increases the amount of information that can be electronically transferred at one time between sites.
Automated Address Range Program	AARP	A program for achieving consistent address/block number relationships between field-verified residential addresses in the master address file and address ranges in the TIGER® database.
automated data processing	ADP	The data processing operations performed by a system of electronic or electrical machines.
Automated Master Address File Geocoding Office Resolution	AMAF-GOR	A computer match that attempts to geocode city-style addresses in the master address file after street features, names, address ranges, and ZIP Code information have been inserted into the TIGER® database from digital files from a local government or commercial source. See Boundary and Annexation Survey, census map preview, digital exchange file, geocode, TIGER®, TIGER® Improvement Program, and targeted map update.

Term	Abbreviation	Description
bar code		A code consisting of a group of printed and patterned bars designed to be scanned and read into computer memory.
barrio		A legal subdivision of a municipio in Puerto Rico, treated as a minor civil division by the Census Bureau. See barrio-pueblo, county subdivision, legal entity, minor civil division.
barrio-pueblo		A legal subdivision of a municipio in Puerto Rico, treated as a minor civil division by the Census Bureau. The barrio-pueblo is differentiated from other barrios because it is the historical center and seat of government of its municipio. See barrio, county subdivision, legal entity, minor civil division.
basic street address	BSA	The house number and street name portion of an address, such as 11 Main Street. The BSA does not include designations for apartments, units, lots, and the like. However, when the address for a specific structure is identified by a number followed by a fraction or letter, such as 11½, or 11A, the fraction or letter is part of the BSA. See address, city-style address, house number and street name address, mailing address.
Be Counted enumeration and Be Counted form	BC/BCF	Includes the Be Counted enumeration procedure and the Be Counted form. The enumeration procedure targets areas that are traditionally undercounted. Unaddressed census questionnaires (Be Counted forms) are placed at selected sites where people who believe they were not counted can pick them up, complete them, and mail them to the Census Bureau. The sites are in targeted areas that local governments and community groups, in conjunction with the Census Bureau, identified as traditionally undercounted.
Be Counted field verification		This operation verifies the existence and the residential status of addresses given to the Census Bureau through the Be Counted program. Any address that is verified is added to the master address file.
best and final offer	BAFO	The final and best technical and price solution a vendor provides for a request for proposal in response to a call from the government contracting officer.
beta site		Located at headquarters, the beta site is an independent operation to test and assure quality, completeness, and security of software systems, hardware systems, and network systems before release to a production environment.
beta testing		Ensures that the hardware, software, and communication components are functioning properly before release to the various decennial operating units.
blanket mailing		There are two definitions for this term: (1) The mailing to all postal patrons (no addresses) of reminder cards or other forms. (2) A strategy that was considered but not implemented for Census 2000: the mailing of replacement questionnaires to either all addresses or all addresses in areas with anticipated low response rates.
block		A geographic area bounded on all sides by visible or non-visible features shown on census maps. A block is the smallest geographic entity for which the Census Bureau collects and tabulates decennial census information. See block boundary, block number, collection block, statistical entity, or tabulation block.

Term	Abbreviation	Description
block boundary		A census map feature, visible (street, road, stream, shoreline, and so forth) or nonvisible (county line, city limit, property line, and so forth), that delimits a census block. Two or more features usually delimit a block, but a single feature may delimit a block in the case of an island or a circular street. A boundary generally must include at least one addressable feature, that is, a feature that can have an address assigned to it. The boundary of a state or county is always a block boundary.
Block Boundary Suggestion Project	BBSP	The first phase of the Census Bureau's Public Law 94-171 program that provides an opportunity for states to suggest visible features, such as block boundaries, that are or may be voting district boundaries for the decennial census.
block canvassing		A Census 2000 field operation that ensures the quality of the master address file within the mailout/mailback area (city-style addresses). The Census Bureau sends canvassers into the field to canvass their assignment areas and ensure that the master address file contains a mailing address for every living quarters. They especially seek hidden housing units, such as attics, basements, or garages converted into housing units, or houses that appear to be one unit but which actually contain multiple housing units. They also update and correct the census maps. Formerly called prec canvass and targeted canvassing. See blue line and canvass.
block cluster		A single block or a group of blocks, varying in size.
Block Definition Project	BDP	A program similar to the Block Boundary Suggestion Project. It applies only to American Indian reservations and Puerto Rico.
block group	BG	A combination of census blocks that is a statistical subdivision of a census tract. Geographic block groups never cross census tracts but may cross the boundaries of county subdivisions, places, urbanized areas, voting districts, and so forth. Tabulation block groups may be split to present data for every unique combination of county subdivision, place, and the like.
block locator map		A Census Bureau map that displays a census block—usually a collection block—and a substantial amount of surrounding area, to help field staff identify where the block is located and determine an efficient route of travel to the block. See collection block, locator map.
block map		A large scale map of an individual census collection block showing the individual roads, streets, and other features, together with their names (if any) within and adjacent to the block. Field staff use block maps to guide them in their canvass of each block, to annotate map changes, and to mark (map spot) and number the location of each residential structure. See assignment area map, block number, collection block, and map spot.

Term	Abbrevia- tion	Description
block number		<p>A number assigned to each census block.</p> <ul style="list-style-type: none"> For collecting information for Census 2000, each census block was identified uniquely within a county (or statistically equivalent entity) by a 4- or 5-digit number. All the collection blocks in a county used the same number of digits. As a result of changes to the TIGER® database after the Census Bureau had numbered the blocks in preparation for Census 2000 field operations, the number could have an alphabetic suffix, to represent one portion of a physical block that was split by an added street or road or by the addition or change of the boundary of a county, American Indian reservation, off-reservation trust land, or military installation; e.g., if an added street bisected Block 1005, the block was split into Blocks 1005A and 1005B to represent the portion of the original collection block on each side of that street. For tabulating data for Census 2000, each census block was identified uniquely within a census tract by a 4-digit number. A 1990 census block number had three digits and might include an alphabetic suffix. The first digit of a tabulation block number identified the block group in which the census block was located.
block numbering area	BNA	Small statistical subdivisions of a county for grouping and numbering blocks in nonmetropolitan counties where local committees of census data users have not established census tracts. For Census 2000, the agency combined the census tract and block numbering area programs into a single program; the resulting geographic entity was called a census tract.
blue line		A boundary defining the area included in mailout/mailback. Essentially, these are areas that have city delivery of mail.
boarded up		A housing condition in which the doors or windows of a building have been covered to prevent destruction or entry.
borough		A county equivalent in Alaska, a minor civil division in New York, and an incorporated place in Connecticut, New Jersey, and Pennsylvania. See governmental unit.
boundary		A line identifying the extent of a geographic entity, such as a block, census tract, county, or place. The legal boundaries the Census Bureau recognizes for a census are those in place on the first day of the census year.
Boundary and Annexation Survey	BAS	An annual survey of all incorporated places and all counties conducted by the Census Bureau to determine the correct legal limits and related information as of January 1 of the survey year. See Automated Master Address File Geocoding Office Operation, census map preview, targeted map update, TIGER®, and TIGER® Improvement Program.

Term	Abbreviation	Description
boundary change		The establishment, relocation, or deletion of a boundary. For legal entities, boundary changes are reported to the Census Bureau in a state, local, or tribal government's response to a Boundary and Annexation Survey; through a periodic survey to collect boundary information for a specific set of geographic entities; as an adjunct to obtaining other information about an area (such as updated street pattern or address information); or by some other reliable source. For statistical entities, boundary changes are provided in preparation for a specific census in response to the Census Bureau's Participant Statistical Areas Program or some other specific boundary collection program. The boundaries of legal entities are changed due to legal actions, whereas statistical entities may be changed by appropriate reviewers to reflect population growth or decline, or because of revisions either to visible or legal features used as boundaries or to Census Bureau procedures. A boundary change also can occur due to an error in recording a boundary for one census or survey and showing it correctly for the next one.
building		Usually a separate structure that has open space on all sides. Townhouses are separate buildings. Some buildings can be used both as a residence and a business, as in the case of an apartment located above a grocery store.
Bureau of Economic Analysis	BEA	Department of Commerce. The BEA's goal is to provide a clear picture of the U.S. economy by preparing, developing, and interpreting the national income and product accounts (summarized by the gross domestic product) as well as aggregate measures of international, regional, and state economic activity.
Bureau of Labor Statistics	BLS	Department of Labor. The BLS is the principal fact-finding agency for the federal government in the broad field of labor economics and statistics.
callback		Repeat telephone calls an enumerator makes to a living quarters to obtain information.
callback record page		A page in an address register used to record information about each callback an enumerator makes to a living quarters to obtain information.
canvass		To systematically travel, block by block, every street, road, path, and the like in an assignment area, identifying every place where people live or could live.
casing check		See postal validation check.
census		A complete enumeration of a population or the business and commercial establishments, farms, or governments in an area. See decennial census.
Census 2000 Committee on Statistical Policy	CCSP	Composed of policy makers and technicians who provided external review and advice. The group reviewed policy matters as they affected decisions about statistical methods to be used.
Census 2000 library		A depository of key Census 2000 documents using an electronic document tracking system. See Personal Computer Document Organization and Control System.
Census 2000 Publicity Office	C2PO	Census Bureau. Developed, implemented, and coordinated an integrated marketing program for Census 2000, including paid advertising, direct mail, public relations, partnerships, and local outreach.
Census Address List Improvement Act of 1994		See Public Law 103-430.

Term	Abbrevia- tion	Description
Census Advisory Committee	CAC	Several advisory committees counseled the Census Bureau on matters relating to Census 2000. The Commerce Secretary's 2000 Census Advisory Committee was composed of representatives of organizations interested in and knowledgeable about the decennial census. The Census Advisory Committee of Professional Associations consisted of nine representatives from each of the following organizations: the American Economic Association, the American Marketing Association, the American Statistical Association, and the Population Association of America. Five race and ethnic advisory committees informed the Census Bureau on matters relating to their communities' participation in the decennial census and uses of census products. These committees represented the following race and ethnic groups: African Americans, American Indians and Alaska Natives, Asians, Hispanics, and Native Hawaiians and Other Pacific Islanders.
census area		The statistical equivalent of a county in Alaska. Census areas are delineated cooperatively with the State of Alaska for statistical purposes in the portions of Alaska not within an organized borough.
census block		See block.
census block map		A map showing the numbered census blocks and appropriate higher-level census geography within a geographic entity or area. A census block map usually consists of multiple map sheets. See block map, Census Bureau map.
Census Bureau	CB	Department of Commerce. The Census Bureau is the country's preeminent statistical collection and dissemination agency. It publishes a wide variety of statistical data about people and the economy of the nation. The Census Bureau conducts approximately 200 annual surveys and conducts the decennial census of the U.S. population and the quinquennial census of industry.
Census Bureau map		Any map, in electronic or paper form, produced by the Census Bureau. Such a map usually displays the boundaries and names and/or codes of the geographic entities that the Census Bureau uses to take a census or survey, or for which the Census Bureau tabulates data, and may include both visible and invisible features, feature names, and other information appropriate to the purpose for which the map was prepared. Some Census Bureau maps display statistical data in various thematic forms. Every Census Bureau map displays a credit note showing that it was produced by the U.S. Census Bureau. May be referred to as "census map" after first usage of the term.
census code		A code assigned by the Census Bureau to identify a specific geographic entity. The Census Bureau uses census codes for geographic entities for which a federal information processing standards code either does not exist or is inadequate to identify and/or sequence a type of entity. See federal information processing standards code, geographic code.
census county division	CCD	A subdivision of a county that is a relatively permanent statistical area established cooperatively by the Census Bureau and local government authorities. Used for presenting decennial census statistics in those states that do not have well-defined and stable minor civil divisions that serve as local governments.
Census Day		The reference date for collection of census information. For the decennial census, this has been April 1 of the decade year (year ending with zero) since the 1930 census.

Term	Abbreviation	Description
census designated place	CDP	A statistical entity comprising a dense concentration of population that is not within an incorporated place but is locally identified by a name. CDPs are delineated cooperatively with state, local, and tribal government officials based on Census Bureau guidelines. For the first time in Census 2000, CDPs did not have to meet a population threshold to qualify for tabulation of census data. See comunidad, place, statistical entity, zona urbana.
census division		See division (census geographic).
census edited file	CEF	This file contains the 100 percent edited characteristics/records for all households and persons in the census. The edits include consistency edits and imputation for items or persons where the data are insufficient. See 100 percent data, census unedited file.
census feature class code	CFCC	A 3- or 4-character alphanumeric code assigned to the various features (points, lines, polygons, and key geographic locations) in the TIGER® database to uniquely identify the basic characteristics of each feature. Only landmarks use 4-character CFCCs, which appear only in the Geography Division's internal files.
census field office	CFO	A temporary Census Bureau office established in Census 2000 to manage address listing field work, conduct local recruiting, and create a local presence.
census geography		A collective term referring to the geographic entities used by the Census Bureau for data collection and tabulation. There is collection geography and tabulation geography.
census identification number		A number associating a response with a specific address in the master address file.
census map		Any map produced by the Census Bureau. A census map displays geographic entities used in a Census Bureau census or survey for which the Census Bureau tabulates data.
census map preview		A Census 2000 program that asked local government officials to review census maps. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, targeted map update, TIGER®, and TIGER® Improvement Program.
Census Monitoring Board		Established by public law, the function of the board was "to observe and monitor all aspects of the preparation and implementation of the 2000 decennial census (including all dress rehearsals and other simulations of a census in preparation therefore)." The board ceased to exist on September 30, 2001.
census region		See region (census geographic).
census statistical areas committee	CSAC	A committee established by local government officials and other interested individuals to identify, in cooperation with the Census Bureau, the census tracts, block groups, census designated places, and other statistical entities for the area it serves.
census statistical areas key person	CSAKP	A person designated by a census statistical areas committee to act as its contact person with the Census Bureau.
census subarea		Statistical subdivisions of boroughs and census areas (county equivalents) in Alaska.
census tract		See tract.
census tract number		See tract number.

Term	Abbreviation	Description
census unedited file	CUF	A file created by merging the control file for the decennial master address file with the decennial response file of unedited data after the primary selection algorithm has been applied. This file contains the final housing unit and person counts. It is used to generate apportionment data as well as related “raw” or unedited census data.
central city		In a metropolitan area (MA), the largest place and, in some areas, one or more additional places that meet official standards issued by the federal Office of Management and Budget. If a place extends beyond an MA, only the portion within the MA is a central city. A few primary metropolitan statistical areas do not have a central city.
central county		A core county (or statistically equivalent entity) of a metropolitan area (MA). Such a county includes at least half the population of a central city of the MA, provided the central city is located in an urbanized area related to the MA, or at least half the population of the related urbanized area(s) in the county. All other counties (or statistically equivalent entities) in an MA are “outlying counties.” MAs in New England do not have a central county.
central place		In an urban area (urbanized area or urban cluster), the largest place and, in some areas, one or more additional places that meet specific Census Bureau criteria. If a place is identified as an extended place, only the portion within the urban area represents the central place. For an urban area that does not contain an incorporated or census designated place, there is no central place; the title of the urbanized area or urban cluster uses the name of a minor civil division, or a local place name recognized by the Board on Geographic Names and recorded by the U.S. Geological Survey, but the name does not represent a central place.
city		A type of incorporated place in all states and the District of Columbia. In agreement with the State of Hawaii, however, the Census Bureau does not recognize the city of Honolulu for presentation of decennial census data. In Virginia, all cities are not part of any county, and the Census Bureau treats them as county equivalents as well as places for purposes of data presentation; there also is one such independent city in each of three states: Maryland, Missouri, and Nevada. In 20 states, some or all cities are not part of any minor civil division, and the Census Bureau treats them as county subdivisions for purposes of data presentation. See county equivalent, county subdivision, governmental unit, incorporated place, and independent city.
city delivery area		An area (1) in which post offices deliver mail to addresses consisting of a house number and street name AND (2) which consists of city delivery routes as designated by the U.S. Postal Service. Some homes and establishments in a city delivery area may choose to use a post office/drawer or general delivery for their mail. See city-style address, nondelivery area, rural delivery area.
city-style address		An address that consists of a house number and street name; for example, 201 Main Street. The address may or may not be used for the delivery of mail and may include apartment numbers/designations or similar identifiers. See address, basic street address, house number and street name address, mailing address, noncity-style address.

Term	Abbreviation	Description
cluster		A range of house number and street name addresses that contains one or more addresses that were not geocoded to a census block. Lists of such address ranges ("cluster lists") were used for Master Address File Geocoding Office Resolution, the TIGER® Improvement Program, and targeted map update, to identify for resolution those address ranges for which the Census Bureau had received one or more addresses that it could not match to a specific location in the TIGER® database.
coefficient of variation	CV	The ratio of the standard error (square root of the variance) to the value being estimated, usually expressed in terms of a percentage (also known as the relative standard deviation). The lower the CV, the higher the relative reliability of the estimate.
collection block		A physical block enumerated as a single geographic area, regardless of any legal or statistical boundaries passing through it. (Except the state and county boundaries are always block boundaries.) See block, block number, tabulation block.
collection geography		The geographic entities used by the Census Bureau for taking a census. For Census 2000, a census field office or local census office/crew leader district/assignment area collection block identified a unique geographic area. See tabulation geography.
Commerce Administrative Management System	CAMS	A system integrating financial and related subsystems for management and administration.
<i>Commerce Business Daily</i>	CBD	A newspaper published by the Department of Commerce in which all procurement notices and awards in the federal government are listed.
commercially available off-the-shelf software/ commercial off-the-shelf software	COTS	Software that may be purchased and implemented for a particular application with minimal or no modification required.
Commonwealth		The legal designation for four states (Kentucky, Massachusetts, Pennsylvania, and Virginia) and two Island Areas (Puerto Rico and the Northern Mariana Islands). The Census Bureau does not use this term in presenting data.
comunidad		A census designated place in Puerto Rico. See census designated place, zona urbana.
compact disk-read only memory	CD-ROM	An optical disk that is created by a mastering process and used for storing large amounts of data. Unlike standard computer disks and diskettes, CD-ROMs can be used only to read stored data, not to update or change its content.
Complete Count Committee	CCC	A volunteer committee established by local, and sometimes state, governments and comprised of a cross-section of community leaders, including representatives from government, education, business, religious organizations, community agencies, minority organizations, and the media. These committees were charged with developing and implementing a Census 2000 outreach, promotion, recruiting, and enumeration assistance plan of action designed to target and address the needs of their community.
computer-assisted personal interview	CAPI	A method of data collection consisting of the interviewer asking questions displayed on a laptop computer screen and entering the answers directly into the computer.
Computer Assisted Survey Research Office	CASRO	Census Bureau. Provides automation and telecommunication technologies to improve the collection, processing, and dissemination of data.

Term	Abbreviation	Description
computer-assisted telephone interviewing	CATI	A method of data collection using telephone interviews in which the questions to be asked are displayed on a computer screen and responses are entered directly into the computer.
concept of operations	CONOPS	The Department of Commerce's reengineered acquisition process.
confidentiality		The guarantee made by law (Title 13, U.S. Code) to individuals who provide census information regarding nondisclosure of that information to others. See Privacy Act, special sworn status individual.
confidentiality edit		The name for the Census 2000 disclosure avoidance procedure.
Congressional Affairs Office	CAO	Census Bureau. Acts as a liaison between Congress and the Census Bureau.
congressional district	CD	An area established by law for the election of representatives to the U.S. Congress. Each CD is to be as equal in population to all other CDs in the state as practicable, based on the decennial census counts.
consolidated city		An incorporated place that has combined its governmental functions with a county or county subdivision but contains one or more other incorporated places that continue to function as local governments within the consolidated government. See consolidated government, incorporated place, legal entity.
consolidated government		A governmental unit that includes two or more legal entities that have joined together to form a common government; for example, a consolidated city-county government.
consolidated metropolitan statistical area	CMSA	A geographic entity designated by the federal Office of Management and Budget for use by federal statistical agencies. An area becomes a CMSA if it qualifies as a metropolitan statistical area (MSA), has a population of 1 million or more, and has component parts that qualify as primary metropolitan statistical areas, provided local opinion favors the designation. CMSAs consist of whole counties except for the New England states, where they consist of cities and towns.
content edit		An operation including a review of questionnaires for missed answers or multiple entries. The edits are designed to improve data quality and reduce item nonresponse.
continuous measurement	CM	Census data is collected once every 10 years. To provide a stream of data between decennial censuses, the Census Bureau has instituted the American Community Survey.
conventional census		See list/enumerate.
Cost and Progress System for Census 2000	C&P	Refers to both the system and the reports generated by the system. The C&P system was a component of the management information system that reported on the cost and progress of address list development and data collection, capture, processing, and dissemination for Census 2000. See Enterprise Information System.
count question resolution	CQR	A process whereby state, local, and tribal government officials could obtain answers to their concerns about the accuracy and completeness of the Census 2000 counts.

Term	Abbreviation	Description
county		A type of governmental unit that is the primary legal subdivision of every state except Alaska and Louisiana (boroughs and parishes, respectively). The Island Areas also do not have counties as their primary legal subdivision (county is a minor civil division in American Samoa). See county equivalent, governmental unit.
county equivalent		A geographic entity that is not legally referred to as a county but is recognized by the Census Bureau as equivalent to a county for purposes of data presentation. Because they contain no county-type subdivision, the Census Bureau treats the District of Columbia and Guam as county equivalents (as well as state equivalents). See also borough, census area, independent city, municipio, parish.
county subdivision		A legal or statistical division of a county recognized by the Census Bureau for data presentation. See barrio, barrio-pueblo, borough, census county division, county subarea, city, minor civil division, town, unorganized territory, village. Also see legal entity, statistical entity.
coverage edit/coverage edit follow-up	CEFU	An edit performed on the mailback census response universe. Staff make telephone calls to resolve forms that are incomplete or have other coverage discrepancies, such as a difference between the number of persons reported in that household and the number of persons for whom census information was provided on the form. This edit includes the large household follow-up.
coverage improvement follow-up	CIFU	A procedure for the traditional census in which housing units with conflicting status information are followed up.
crew leader	CL	The immediate supervisor of a team of listers, enumerators, or other field staff for a decennial census. See crew leader district, field operations supervisor.
crew leader district	CLD	The district area assigned to a crew leader, formed by grouping together a number of enumerator assignment areas.
crews of vessels		The shipboard populations of U.S. Navy, U.S. Coast Guard, and merchant marine vessels. For geographic purposes, they are assigned to the offshore area adjacent to their home port.
Customer Liaison Office	CLO	Census Bureau. The CLO is the point of contact between the Census Bureau and its external customers, both public and private. The external customers include government organizations, such as the state data centers, business and industry data centers, census information centers, governors' liaisons for Census 2000, and tribal governmental leaders, and nongovernment entities, such as the national labor unions and national nonprofit organizations.
dangerous settlements		Compounds where listers have encountered dangerous situations, such as militia groups. The listers are instructed to note the living quarters as a special place and to not interview. Though listed as a special place, special place operations are not conducted at these living quarters. Procedures for listing and enumerating these settlements include interviewing the local postmaster and public officials.
Data Access and Dissemination System	DADS	Now called the American FactFinder.
data capture audit resolution	DCAR	An edit and review on response records. An edit compares a derived count of persons to the questionnaire count. Edit failures may be resolved in-house or referred to coverage follow-up.

Term	Abbreviation	Description
data capture center	DCC	A decentralized facility that checks in questionnaires returned by mail, creates images of all questionnaire pages, and converts data to computer-readable format. The DCCs also perform other computer-processing activities, including automated questionnaire edits, work flow management, and data storage. There is one permanent DCC, the National Processing Center. For Census 2000, the Census Bureau set up three temporary DCCs. The temporary facilities were provided and operated by a private contractor through the data capture services contract.
Data Capture Management Information System	DMIS	A computerized management information system developed for use in the data capture centers. It provides automated tools to facilitate and support the management of the centers.
data capture services contract	DCSC	The contract that provides the facilities for data capture center operations and services.
Data Capture System 2000	DCS 2000	The data capture system that was used to capture information from census forms. This system incorporated the following activities: processing more than 120 million incoming forms; digitally capturing and processing billions of bits of information on the forms; converting automatically the image of the form to text-based data; and editing/repairing data that the system was unable to decipher automatically.
Data Preparation Division	DPD	Now called the National Processing Center.
Decennial Applicant Name Check	DANC	An automated system used to screen all applicants' backgrounds for criminal histories to facilitate the selection, hiring, promotion, and payrolling of qualified and suitable applicants for the conduct of Census 2000.
decennial census		The census of population and housing, taken in each year ending in zero. Article 1, Section 2 of the Constitution requires that a census be taken every 10 years for the purpose of apportioning the U.S. House of Representatives. The first census of population was taken in 1790. The Census Bureau first conducted the census of housing in 1940.
Decennial Cost Model	DCM	The primary tool for documenting and analyzing budgetary resources needed to support program requirements. It contains assumptions and parameters used to describe and analyze the budget components.
decennial field interface	DFI	The collection of systems used in the regional census centers, the census field offices, and the local census offices to control and manage the census data collection effort. It includes, among others, the operations control, payroll and personnel, map production, and management information systems.
Decennial Management Division	DMD	Census Bureau. The DMD directs and monitors the decennial census. It coordinates and provides project management for all census operations; maintains the master activity schedule, the Cost and Progress System, the Executive Information System, and the Decennial Cost Model; manages the decennial budget; manages decennial communications, issue resolution change control, and requirements documentation; and directs development of the census plan.

Term	Abbreviation	Description
decennial master address file	DMAF	Had features for controlling and tracking the long- and short-term operations and programs of Census 2000. Contained the processing status information to support document mailouts; data capture progress control, tracking, and reporting; and field enumeration processes (notably follow-ups). The base file for sampling housing units for programs, such as long-form implementation. Limited to addresses that the Census Bureau successfully linked to the TIGER® database. See master address file.
decennial response file	DRF	Contains every response to the census from all sources. The primary selection algorithm is applied to this file to unduplicate persons between multiple returns for a housing unit and to determine the housing unit record and the persons to include at the housing unit. The DRF is then combined with the decennial master address file to create the census unedited file.
Decennial Statistical Studies Division	DSSD	Census Bureau. Develops mathematical and statistical techniques for the design and conduct of the census.
Decennial Systems and Contracts Management Office	DSCMO	Census Bureau. Developed and managed major Census 2000 contracts to process Census 2000 data and disseminate data to the public.
delete		The status for an address in the master address file that no longer qualifies as a living quarters.
delivery sequence file	DSF	A computerized file containing all delivery point addresses serviced by the U.S. Postal Service (USPS). The USPS updates the DSF continuously as its letter carriers identify addresses for new delivery points or changes in the status of existing addresses.
demographic analysis	DA	An independent, macro-level approach to validate the census results. Estimates using demographic analysis are based on aggregate sets of administrative data, including birth and death records, immigration statistics, and Medicare data.
digital exchange file		An electronic file of roads and streets, their names, address ranges, and ZIP Codes obtained from a local government or commercial source and used to update TIGER®.
digital line graph		Digital information derived by the U.S. Geological Survey from its maps.
direct access		An entrance to a living quarters directly from the outside of the building or through a common or public hall (as in an apartment building).
direct sample follow-up		A methodology for nonresponse follow-up sampling whereby the initial response period stops at a specified date and a sample is selected from all remaining nonresponding units.
Director		Census Bureau. Determines policies and directs the programs of the Census Bureau, taking into account applicable legislative requirements and the needs of users of statistical information.
disclosure avoidance	DA	Statistical methods used in the tabulation of data prior to releasing data products to ensure the confidentiality of responses.
district office	DO	A pre-Census 2000 term for local offices established by the Census Bureau to conduct the decennial census. See census field office, local census office.

Term	Abbreviation	Description
division (census geographic)		A grouping of states within a census geographic region, established by the Census Bureau for the presentation of census data. The nine divisions (East North Central, East South Central, Middle Atlantic, Mountain, New England, Pacific, South Atlantic, West North Central, and West South Central) are intended to represent relatively homogeneous areas that are subdivisions of the four census geographic regions.
dress rehearsal	DR	A census of population and housing conducted in selected areas prior to a decennial census to determine the effectiveness of planned census operations. The Census 2000 Dress Rehearsal was conducted in 1998 in Sacramento, California; Menominee County, Wisconsin, including the Menominee American Indian reservation; and 11 counties in South Carolina, including the city of Columbia.
Dual Independent Map Encoding	DIME	Term used in the 1990 census. See Geographic Base File/Dual Independent Map Encoding.
dual system estimation	DSE	The estimation methodology used for the Accuracy and Coverage Evaluation (A.C.E.). This operation uses a geographic sample of block clusters to find persons missed by the census or A.C.E. and any errors from the census. The persons from the unedited census files are computer matched and then clerically matched to the data collected from the A.C.E. interviews. After the computer matching, the person matching continues through the following steps: clerical matching, field follow-up to resolve discrepancies, and a final clerical matching.
E-Sample		In the Census 2000 Accuracy and Coverage Evaluation (A.C.E.) program, the E-sample consisted of people enumerated in the census in the A.C.E. sample block clusters.
E-911 address		A number, usually unique within a county, posted on or near a structure, especially in rural areas, for use by emergency personnel to locate the structure. An E-911 address is a house number and street name address, which may or may not be used for mail delivery.
early opening local census offices	ELCO	Local census offices (LCOs) that open a year earlier than other LCOs to conduct operations required for a traditional (nonsampling) census.
economic census		The collective name for the censuses of construction, manufactures, minerals, minority- and women-owned businesses, retail trade, service industries, transportation, and wholesale trade, conducted by the Census Bureau every 5 years (in years ending in 2 and 7).
Economics and Statistics Administration	ESA	Much of the statistical, economic, and demographic information collected by the federal government is made available to the public through the ESA. The ESA has two principal agencies: the Census Bureau and the Bureau of Economic Analysis.
embedded housing unit	EHU	One of two kinds of housing units found at a special place. An EHU is a housing unit within a group quarters where the occupants live separately from others living in the group quarters. An example of an EHU is a house parent's room in a dormitory. Embedded means located within the building and not free-standing.

Term	Abbreviation	Description
emergency shelters		Includes shelters that operate on a first-come, first-served basis where people must leave in the morning and have no guaranteed beds for the next night or where people know they have a bed for a specified period of time even if they leave the building every day. Shelters also include facilities that provide temporary shelter during extremely cold weather (such as churches) and facilities that provide emergency shelter for runaway or neglected children or abused women. Emergency shelters are service locations. See hotels, motels, or other facilities; regularly scheduled mobile food vans; service locations; shelters for children who are runaways, neglected, or without housing; soup kitchens; transitional shelters.
enhanced list	E/L	Listing of addresses in blocks that were selected to be included in the Integrated Coverage Measurement survey. Conducted independently of the general address listing activities and enhanced using additional procedures to obtain the most complete address listing possible.
Enterprise Information System or Executive Information System	EIS	Used with the Cost and Progress System for Census 2000 to access reports and data from the warehouse and to report to the Department of Commerce on decennial issues, the schedule, and the cost framework.
enumeration		The process of interviewing persons and recording the information on census forms.
enumeration district		Obsolete term. Now called an assignment area.
enumerator		A Census Bureau employee who interviews people to obtain information for a census questionnaire. The term also applies to field personnel who perform activities associated with update/leave and urban update/leave.
Estimation Review System	ERS	A system used for a sampling census that provides the statistical results of the various types and phases of the estimation process to the analysts.
Executive Information System		See Enterprise Information System.
executive steering committee		The assistant to the associate director for the decennial census, associate director for the decennial census, principal associate director for programs, principal associate director/chief financial officer, associate director of field operations, and the deputy director.
extended city		See extended place.
extended place		A place that contains both urban and rural territory; i.e., an incorporated place or census designated place that is partially within and partially outside of an urbanized area or urban cluster. First used for Census 2000. Previously referred to as an "extended city," which applied only to incorporated places, subject to very specific criteria.
facility questionnaire		See Special Place Facility Questionnaire.

Term	Abbreviation	Description
false entity		A legal geographic entity of one type that is used to complete the coverage of another part of the Census Bureau's geographic hierarchy. The Census Bureau uses false entities to ensure complete coverage for certain levels of the hierarchy; for example, to ensure that all area in the nation is assigned to a geographic entity at the county level. The Census Bureau treats the District of Columbia as equivalent to both a state and a county for data presentation purposes; the county record is a false entity. The Census Bureau treats Alexandria, VA, as a place and as a statistical equivalent of both a county (see independent city) and county subdivision (see independent place); the county and county subdivision records are false entities.
feature		Any part of the landscape, whether natural (such as a stream or ridge) or artificial (such as a road or power line). In a geographic context, features are any part of the landscape portrayed on a map, including nonvisible boundaries of legal entities, such as city limits or county lines. See nonstreet features, nonvisible feature, visible feature.
federal information processing standards code	FIPS	A standardized set of numeric or alphabetic codes issued by the National Institute of Standards and Technology to ensure uniform identification of geographic entities through all federal government agencies. The entities covered are states, counties, metropolitan areas, congressional districts, foreign geographic entities, named populated and related location entities (such as places and county subdivisions), and American Indian and American Native areas.
field assignment	FA	A combination of the assignment areas used in a previous operation to form a better workload for an enumerator. See assignment area.
Field Division	FLD	Census Bureau. Plans and directs the collection of national sample survey, census, and other data at the local level. Data are collected through a flexible field organization of regional offices in 12 major cities across the country. The offices employ part-time interviewers who gather data by direct contact with the public. During major censuses, the division administers temporary regional census centers, district offices, and other offices.
field follow-up	FFU	A data collection procedure involving personal visits by enumerators to residential addresses to perform any of the following operations: resolve inconsistent or missing data items on returned questionnaires identified during content edit and possible enumeration errors discovered in coverage edit; conduct vacant/delete check; obtain data for blank or missing questionnaires; and check on addresses for which no questionnaire has been checked in.
field operations supervisor	FOS	Supervises activities of crew leaders and enumerators.
film optical sensing device for input to computers	FOSDIC	A device that reads microfilmed questionnaires and transfers the data to magnetic tape for the Census Bureau's mainframe computers. Created by the Census Bureau for the 1960 census.
follow-up	FU	A secondary census or survey operation, predominantly in data collection, carried out to successfully complete an initial operation. It is most often a telephone or personal visit interview to obtain missing data or clarify original responses. See field follow-up, nonresponse follow-up.
free-standing housing unit	FSHU	One of two kinds of housing units found at a special place. A FSHU is a living quarters that is physically separate from the group quarters at a special place. An example of an FSHU is a president's house at a college.

Term	Abbreviation	Description
Freedom of Information Act	FOIA	Created in 1974. An act that requires federal agencies to provide access to and copies of existing agency records to the public. Access can be denied only if records are within specific exempted categories, such as Title 13 data.
frontloading		Hiring and training approximately twice as many enumerators as are needed for decennial field operations to compensate for expected turnover.
functional status		The classification of a geographic entity as a legal or statistical entity. It further identifies a legal entity as an active, inactive, false, functioning, or nonfunctioning entity and, if active, denotes its fiscal independence and whether it provides general or limited special services. Functional status may determine an entity's eligibility to participate in various Census Bureau programs.
functioning entity		A generic term that refers to both active and inactive governmental units. (Even though inactive, a governmental unit has the legal capacity to carry out governmental functions; local people simply choose not to do so.) See active entity, governmental unit, inactive entity, nonfunctioning entity.
gated community		A community, composed of individual houses, duplexes, or apartment buildings, surrounded by a secured fence or other barrier allowing limited access through a secure gate.
General Services Agency	GSA	A central management agency that sets federal policy in such areas as federal procurement, real property management, and information resources management.
geocode		A code that identifies a specific geographic entity. For example, geocodes needed to identify a census block for data collection are the state code, the county code, and the block number.
geocoding		The assignment of an address, structure, key geographic location, or business name to a location that is identified by one or more geographic codes.
Geographic Base File/Dual Independent Map Encoding	GBF/DIME	The predecessor of TIGER®.
Geographic Catalog of Legal and Statistical Entities	GEO-CAT	A file that controls and describes the inventory of the higher-level geographic entities maintained by the Census Bureau, including their names, codes, attributes and hierarchical relationships. The GEO-CAT, which is part of the TIGER® system, does not include lower-level entities such as census tracts, block groups, and census blocks.
geographic code		A code, consisting of one or more alphanumeric or special-text characters, used to identify a specific geographic entity. Every geographic entity recognized by the Census Bureau is assigned one or more geographic codes. Also referred to as a geocode. See census code, federal information processing standards code.
geographic database		A computer-readable database whose primary structure includes geographic codes and/or coordinates (latitude and longitude), together with associated attributes. The TIGER® database is a geographic database.
geographic entity		A geographic unit of any type, legal or statistical, such as a state, county, place, county subdivision, census tract, or census block.

Term	Abbreviation	Description
geographic hierarchy		A geographic presentation that shows the geographic entities in a superior/subordinate structure. In this system of relationships among geographic entities, each entity (except the smallest one) is divided into lower-order units that in turn may be subdivided further. For example, states are subdivided into counties, which are subdivided into both county subdivisions and census tracts. The Census Bureau uses three sets of hierarchies: one is based on states and counties; another on American Indian areas, Alaska Native areas, and Hawaiian Home Lands; and a third on metropolitan or urban areas. See census geography, tabulation geography.
geographic information system	GIS	A computer system for the input, storage, processing, applications development, retrieval, and maintenance of information about the points, lines, and areas that represent the streets and roads, rivers, railroads, geographic entities, and other features on the surface of the Earth—information that previously was available only on paper maps.
geographic program participant database	GPP	A Census Bureau control file that records information about participation by local governments in census programs designed to improve the content of TIGER® and expand the master address list.
geographic reference file	GRF	A generic term for a file that contains geographic information such as area names, geographic codes, and selected x, y coordinate values. These files are necessary for the Census Bureau to organize the address list for the field activities and for production of tabulation displays.
Geographic Support System	GSS	The TIGER® system plus all other activities supporting the census and survey activities of the Census Bureau. This includes all decennial census geographic products, all economic and agriculture censuses geographic products, all American Community Survey geographic products, and the related computer systems. The Census Bureau's GSS also includes the geographic activities related to the master address file, the special census program, the current sample survey program, the Census Bureau's research and development activities, the operations that use the information collected by the Boundary and Annexation Surveys, references for map sources, etc.
Geographic Update System	GUS	The operations in the regional offices (ROs) and regional census centers (RCCs) that implemented the update of the information in the TIGER® database. Also, a computer software package for the 1990 census that enabled census staff in the Census Bureau's ROs/RCCs and the then Data Preparation Division to view, analyze, and interactively update and revise the information in the TIGER® database as a result of various field operations. See Geographic Update System for X Window (GusX).
Geographic Update System for X Window	GusX	The Census 2000 version of the Geographic Update System (GUS) software. It was more flexible, object-oriented, and user-friendly than the GUS, with operators at various decentralized sites using the Census Bureau's UNIX workstations to access and manipulate information in the TIGER® database. The X refers to the software that runs the X Window Utility program, together with a Motif graphical user interface, on a UNIX platform.
Geography Division	GEO	Census Bureau. GEO defines decennial census geography; creates and maintains the master address file; spatially locates addresses using the TIGER® database; maintains and updates TIGER®; and provides geographic support for other business, economic, and government surveys and censuses.

Term	Abbreviation	Description
Government Accountability Office	GAO	An investigative arm of the Congress that performs audits and evaluations of government programs and activities.
Government Printing Office	GPO	U.S. government. The mission of the Government Printing Office is to inform the nation by producing, procuring, and disseminating printed and electronic publications of the Congress as well as the executive departments and establishments of the federal government.
governmental unit	GU	A governmental unit is an organized entity which, in addition to having governmental character, has sufficient discretion in the management of its own affairs to distinguish it as separate from the administrative structure of any other governmental unit. To have governmental character, an entity must have existence as an organized entity and responsibility to the public.
group quarters	GQ	A place where people live or stay other than the usual house, apartment, or mobile home. Two general types of group quarters are recognized: institutional (for example, nursing homes, mental hospitals or wards, hospitals or wards for chronically ill patients, hospices, and prison wards) and noninstitutional (for example, college or university dormitories, military barracks, group homes, shelters, missions, and flophouses). Group quarters may have housing units on the premises for staff or guests.
group quarters enumeration		An operation designed to enumerate people living or staying in group quarters. Enumerators visit each special place with group quarters, list the names of the people living or staying there, and leave an Individual Census Report for each person to complete. Enumerators return at a later date to pick up the forms and, if necessary, conduct interviews to obtain any missing information or conduct interviews with nonrespondents. See group quarters.
hard to enumerate	HTE	A term used to describe an area whose environment or population may present difficulties for enumeration.
Hawaiian Home Lands	HH	Areas created as a result of the Hawaiian Homes Commission Act of 1920 to provide agricultural, pastoral, and residential land for native Hawaiians.
headquarters	HQ	A term sometimes used to designate the Census Bureau facility, staff, and operations in Suitland, MD.
heterogeneity		Heterogeneity occurs when blocks of housing units assigned to sampling strata or groupings do not have equal chances of being included or missed by the census or survey. Heterogeneity creates difficulty for the small area estimation process because the correction factor is applied to all people with the specified characteristic in that sampling poststratum even though some of them do not actually have the coverage characteristics.
highest elected official		The elected or appointed person who is the chief executive official of a governmental unit and is most responsible for the governmental activities of the governmental unit, such as the governor of a state, chair of a county commission, or mayor of an incorporated place.
historic areas of Oklahoma		The area encompassing the former American Indian reservations that had legally established boundaries during the period 1900 through 1907 but were dissolved during the 2- to 3-year period preceding the establishment of Oklahoma as a state in 1907. The 1980 census tabulated data for this entity, but it was replaced for the 1990 census by tribal jurisdiction statistical areas.

Term	Abbreviation	Description
homogeneity		Homogeneity assumes that all people in a particular sampling stratum or poststratum have an equal chance of being included or missed by the census or survey. A lack of homogeneity in a particular sample block is not an error, but it does create difficulty for the small area estimation process. This happens because the correction factor is applied to all people with the specified characteristic in that poststratum even though some of them do not exhibit the same coverage characteristic.
hotels, motels, or other facilities		Hotels, motels, or other facilities for which vouchers are provided or that operate under contract to provide shelter to people without housing. These are service locations. See emergency shelters; regularly scheduled mobile food vans; service locations; shelters for children who are runaways, neglected, or without housing; soup kitchens; and transitional shelters.
house-number and street-name address	HN/SN	An address assigned to a specific structure, consisting of a number and the street name on which the structure is located. The address may or may not be used for mail delivery. See address, basic street address, city-style address, mailing address.
household		A person or group of persons who live in a housing unit. These equal the count of occupied housing units in a traditional census.
householder		The member of a household who lives at the housing unit and owns or rents the living quarters. If there is no such person present, any household member who is at least 15 years of age can answer the questionnaire.
Housing and Household Economic Statistics Division	HHES	Census Bureau. In concert with others at the Census Bureau, HHES compiles, analyzes, and publishes data on the physical, social, and financial characteristics of the nation's housing and on the socioeconomic characteristics of the nation's population.
housing unit	HU	A house, an apartment, a mobile home or trailer, a group of rooms, or a single room that is occupied as a separate living quarters, or, if vacant, is intended for occupancy as a separate living quarters. See separate living quarters.
identification number		See census identification number.
imputation		When information is missing or inconsistent, the Census Bureau uses imputation to assign values. Imputation relies on the tendency of households of the same size within a small geographic area to be similar in most characteristics. For example, the value of "rented" is likely to be imputed for a housing unit not reporting on owner/renter status in a neighborhood with multiunits or apartments where other respondents reported "rented" on the census questionnaire. There are two major types of imputation: (1) allocation, in which missing values for individual items are filled in on the basis of other reported information for the person or household (or from other persons or households with similar characteristics) and (2) substitution, in which <i>all</i> of the information for a person or household is created from other persons or households with similar characteristics.
incorporated place		A type of governmental unit incorporated under state law as a city, town (except the New England states, New York, and Wisconsin), borough (except in Alaska and New York), or village and having legally prescribed limits, powers, and functions. See consolidated city, governmental unit, independent city, legal entity, place.

Term	Abbreviation	Description
independent city		An incorporated place that is a primary division of a state and legally not part of any county. The Census Bureau treats an independent city as both a county equivalent and county subdivision for data tabulation purposes. See city, county equivalent, county subdivision, incorporated place.
independent place		In a state in which the Census Bureau recognizes minor civil divisions (MCDs), an incorporated place that is not legally part of any MCD. The Census Bureau treats an independent place as equivalent to a county subdivision and as an incorporated place for data presentation purposes. Independent places exist in 23 states and the District of Columbia.
index map		A map that shows the relationship between the map sheets, including inset maps, that cover a specific mapped geographic entity.
Individual Census Questionnaire	ICQ	A questionnaire that contains population questions for one person. The form is used at both soup kitchens and regularly scheduled mobile food vans. This form asks if the person has a usual residence but does not ask housing questions. It also asks about the person's use of services at shelters, soup kitchens, or mobile food vans. Enumerators conduct personal interviews using this form. See service-based enumeration, targeted nonsheltered outdoor location.
Individual Census Report	ICR	A questionnaire that is used during group quarters enumeration and at two service locations (shelters and targeted nonsheltered outdoor locations) that contains population questions for one person. There are both long- and short-form versions. In most group quarters, additional questions are asked of a sample (1 in 6) of the population. The forms ask if the person has a usual residence but does not ask housing questions. Enumerators distribute this form to the clients to complete. At targeted nonsheltered outdoor locations enumerators conduct personal interviews using this form. See group quarters enumeration, self-enumerating places.
industry and occupation	I&O	The current or most recent job activity reported on the census long-form questionnaire. These responses require coding and classification processing.
inset map		A Census Bureau map that displays an area at a larger scale than the scale of its parent sheet. Inset maps generally cover a densely developed area that cannot be shown clearly at the map scale of the parent sheet. See map inset.
Inspector General	IG	Department of Commerce. The IG conducts and supervises audits, inspections, and investigations of Department of Commerce programs and operations.

Term	Abbreviation	Description
Integrated Coverage Measurement	ICM	<p>This operation was proposed for Census 2000 but was not implemented. The objective of such an operation is to measure how well the Census Bureau counted people and housing in a census. A large-scale sample survey is conducted independently of regular census operations. The sample consists of block clusters in urban and rural areas. The results are matched to census results and estimates of the undercount are created. It is a micro-level approach; that is, case-by-case matching.</p> <p>There are three phases to such an operation. In the <i>housing unit phase</i>, an inventory of housing within sample blocks is conducted separately from the census. In the <i>computer-assisted personal interview (CAPI) phase</i>, an independent sample of nonrespondents is taken, and telephone and personal visit second interviews are conducted to create an independent roster. In the <i>person-matching phase</i>, persons enumerated in the census are matched to persons enumerated in the CAPI phase, follow-up interviews for discrepancies are conducted, unresolved cases are imputed as a last resort, and statistical procedures are used to produce estimates of the people missed or duplicated in the census. The final phase of such an operation is to use dual system estimation to compare the census counts to the ICM counts and create estimation factors to adjust the census results. Also called the Quality Check Survey.</p>
interactive voice recognition	IVR	An automated telephone system that offers callers different menu choices covering a variety of predetermined topics.
internal point		A set of geographic coordinates (latitude and longitude) that is located within a specified geographic entity. For many entities, this point represents the approximate center of the entity; for some, the shape of the entity or the presence of a body of water causes the central location to fall outside the entity or in water, in which case the point is relocated to land area within the entity. The geographic coordinates are shown in degrees to six decimal places in census products.
Internet Questionnaire Assistance	IQA	An operation which allows respondents to use the Census Bureau's Internet site to (1) ask questions and receive answers about the census form, job opportunities, or general questions about the purpose of the census and (2) provide responses to the short form.
Island Areas	IA	Islands included in the U.S. Census of Population and Housing are U.S. Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, and American Samoa. Puerto Rico is sometimes called an island area. These were formerly called outlying areas.
invalid return detection	IRD	A procedure for identifying invalid non-ID'd forms, that is, forms returned in Census 2000 as an attempt to introduce error into the population count.
joint use area		Territory that is administered, claimed, and/or used by two or more American Indian tribes. It may consist of overlap of territory of adjoining American Indian reservations or Oklahoma tribal statistical areas, or off-reservation trust land for one tribe that is located within the reservation of another tribe. Such territory was referred to as joint area for the 1990 census.
key from image	KFI	An operation in which keyers enter data by referring to a scanned image of a questionnaire for which data could not be recognized by optical character recognition with sufficient confidence.

Term	Abbreviation	Description
key from paper	KFP	An operation in which keyers enter data directly from a hardcopy questionnaire which could not be read by optical character recognition.
large household	LHH	A housing unit with more than six persons.
large household follow-up	LHFU	A census operation that follows up on a household that indicated on the census form more than six persons in that housing unit. The questionnaire only allows for the reporting of information for six persons per household. This operation is included in the coverage edit.
late mail return	LMR	Mail received after the cut-off date for identifying nonresponding housing units for the nonresponse follow-up operation.
legal entity		An entity whose origin, boundary, name, and description result from charters, laws, treaties, or other administrative or governmental action, such as the United States, states, the Island Areas, counties, cities, townships, boroughs, towns, villages, American Indian reservations, Alaska Native Villages, congressional districts, and school districts. The legal entities recognized for a decennial census are those in existence on January 1 of the decennial census year.
list/enumerate	L/E	A method of data collection in sparsely populated (rural) and remote areas, such as remote Alaska. The procedures are to list addresses or physical locations for housing units, enumerate the household, and update the census map as needed. The enumerators list each residential address or location description and conduct the enumeration in one visit using a short- or long-form according to the sampling pattern for the assignment area.
lister		A census employee who obtains addresses and related information and records the information on address listing pages and census maps.
living quarters	LQ	A dwelling where people live, stay, or could live. Living quarters are classified as housing units or group quarters. They are usually found in structures intended for residential use but also may be found in structures intended for nonresidential use as well as tents, vans, shelters for people without housing, dormitories, barracks, and so forth.
local census office	LCO	Temporary Census Bureau offices established for Census 2000 data collection purposes. Called "district office" in previous censuses.
Local Update of Census Addresses	LUCA	A Census 2000 program, established in response to requirements of Public Law 103-430, that provided an opportunity for local and tribal governments to review and update individual address information in the master address file and associated geographic information in the TIGER® database to improve the completeness and accuracy of both computer files. The governments had to sign a confidentiality agreement to participate. Also called the address list review program.
Local Update of Census Addresses field verification		An operation verifying the existence and the residential status of addresses given to the Census Bureau by local officials during the LUCA program.
location description		A description of the physical location or characteristics of a living quarters that does not have a house-number and street-name address.

Term	Abbrevia- tion	Description
locator map		A census map that helps enumerators find the location of and determine how to travel to their assignment areas. The map covers more area than the assignment area.
long form	LF	The decennial census questionnaire containing 100 percent and sample questions. See short form.
long-form sampling		A variable rate sampling plan is used to determine which households receive the long form. The Census Bureau samples for the long form using four rates based on the size of a government. Nationally, or overall, 1 in 6 households receive a long form. This is a sample for content; that is, a sample determining which households receive the long-form content.
mail census area		The area covered by the mailout/mailback, update/leave, and urban update/leave methods of enumeration.
mail response rate		The total number of <i>checked-in</i> questionnaires returned by mail divided by the number of questionnaires mailed by the U.S. Postal Service or delivered by census enumerators. This check-in rate differs from a true mail response rate because it reflects forms that have been processed and not necessarily all of those that have been received.
mail return rate		The total number of households returning a questionnaire by mail divided by the number of <i>occupied</i> housing units that received a questionnaire by mail or by a census enumerator (the only ones that can return a questionnaire). This measure cannot be derived until the enumeration is completed and the final number of occupied housing units is determined.
mailing address		This address is used by a living quarters, special place, business establishment, and the like to receive mail. It may be a house number and street name, which may be followed by an apartment, unit, or trailer lot designation; building or apartment complex name and apartment designation; trailer park name and lot number; post office box or drawer; rural route or highway contract route, which may include a box number; or general delivery. A mailing address also includes a ZIP Code. A mailing address may serve more than one living quarters, establishment, or the like. See basic street address, city delivery area, city-style address, house-number and street-name address, non-city-style address, nondelivery area, rural delivery area, ZIP Code.
mailout/mailback	MO/MB	A method of data collection in which the U.S. Postal Service delivers addressed questionnaires to residents who are asked to complete and mail back the questionnaire to the appropriate Census Bureau office. This method is used for more than 80 percent of all households (usually city-style addresses).
Management Information System	MIS	Provides decision support functions, such as critical-path analysis and what-if analysis. Provided information on dates, the responsible organization, budget, cost to date, and current progress of Census 2000 operations. It includes the master activity schedule, the Executive Information System, and the Cost and Progress System.
map feature		Any part of the landscape, whether visible—either physical (i.e., natural features such as water bodies and their shorelines, mountain peaks) or cultural (i.e., manmade features such as roads, streets, railroads, power lines)—or invisible on the ground (e.g., boundaries of legal entities, national parks, and military installations; property lines; imaginary street extensions), that is portrayed on a map as a point, line, or area. See boundary, feature, nonstreet feature.

Term	Abbreviation	Description
map image metafile	MIM	A computer file that provides a full-image description of a census map in digital form (a human-readable format). The regional offices, regional census centers, and National Processing Center use MIMs to create maps for printing or placing on CD-ROM. See single MIM-based integrated mapping system.
map inset		A sketch map drawn by an enumerator, lister, etc., to represent an enlargement of an area that, on the original Census Bureau map, is too small to clearly display added streets and/or map spots and map-spot numbers. The map usually is drawn on the back of the map sheet that contains the enlarged area, but a separate sheet of paper may be used for this purpose. See inset map.
map legend		An illustrated list of map content: the symbols, type styles, and, if appropriate, shading or colors shown on a map or map series, and the meaning of each.
Map Plotting System	MAPS	The MAPS site or area is the portion of the regional office/regional census center in which maps are produced, assembled, and stored.
map spot		An enumerator places a dot on a census map to show the location of one or more living quarters. The enumerator assigns a number, unique within the census block, to each map spot to correspond to the entry in the address register for a basic street address or residential structure. The map spots are entered into the TIGER® system. For Census 2000, map spots were identified primarily by census listers and enumerators during address listing and list/enumerate operations but also created during the Local Update of Census Addresses, update/leave, rural update/enumerate, and some follow-up operations.
map spot number		The number assigned uniquely to each map spot within a census collection block. The same number could represent more than one living quarters if they were located in a multiunit structure. Map-spot numbers began with "1" in each collection block and continued until every residential structure in a block was represented by a map spot. Map-spot numbers could include one or more alphabetic suffixes, to account for residential structures added between previously listed ones during quality assurance rework of a listed block, update/leave, update/enumerate, and Census 2000 follow-up operations; e.g., if a missing living quarters was found between map spots 11 and 12, it could be assigned the number 11A. There could be gaps in the numbering system if a map spot had been deleted because a listed living quarters was found not to exist or to have been mislocated. If a map spot represented more than one living quarters, the number of living quarters was shown in parentheses after the map spot number on the map. The Census Bureau assigned special 4-digit numbers to represent various types of special places/group quarters.
Marketing Services Office	MSO	Census Bureau. The MSO creates innovative and effective marketing communication channels, enhances the corporate marketing infrastructure, infuses a marketing culture and customer orientation, institutionalizes internal customer information systems, and assists in new product development.
master activity schedule	MAS	A schedule of all activities involved in the planning, preparation, conduct, and data capture, processing, and dissemination of the Census 2000.

Term	Abbreviation	Description
master address file	MAF	The MAF is a list of every living quarters nationwide and their geographic locations. The computer file was created by combining the addresses in the 1990 address control file with the current versions of the U.S. Postal Service delivery sequence file, and supplementing this with address information provided by state, local, and tribal governments. The MAF ties to the TIGER® database. The MAF was updated throughout the decade to provide addresses for delivery of Census 2000 questionnaires, to serve as the sampling frame for the Census Bureau's periodic demographic surveys, and to support other Census Bureau statistical programs. See decennial master address file.
Master Address File Geocoding Office Resolution	MAFGOR	An operation where the regional offices and regional census centers try to find the location of addresses from the U.S. Postal Service that did not match to the records in TIGER®. Staff use atlases, maps, city directories, and the like to locate these addresses and add them to TIGER®.
master address file update file	MAFUF	Census Bureau staff do not individually key new addresses and address revisions directly into the master address file (MAF). Instead, using a specified format, they key the relevant information into a file—MAFUF—that stores the information until the Geography Division is ready to merge the complete updated file into the MAF in a batch process.
metropolitan area	MA	A collective term established by the federal Office of Management and Budget (OMB) in 1990 to refer to metropolitan statistical areas, consolidated metropolitan areas, New England county metropolitan areas, and primary metropolitan statistical areas. The OMB establishes MAs based on census data.
metropolitan statistical area	MSA	These are designated by the federal Office of Management and Budget for use by federal statistical agencies. These geographically based entities are a core area with a large population nucleus plus adjacent communities with a high degree of economic and social integration with the core. An MSA consists of one or more counties, except in New England, where MSAs are defined in terms of cities and towns; however, New England county metropolitan areas are defined in terms of counties. See consolidated metropolitan statistical area, metropolitan area, New England county metropolitan area, primary metropolitan statistical area, and statistical entity.
Military Census Report	MCR	Questionnaire used to conduct the census in military installations.
military/maritime enumeration		An operation counting domestic military installations and ships assigned to a home port in the United States and maritime vessels in operation on Census Day.
minor civil division	MCD	For demographic census purposes, a primary government, such as a township, or an administrative subdivision of a county, such as a precinct or magisterial district.
multiunit structure		A building that contains more than one housing unit (for example, an apartment building).
municipality		A legally established entity in Alaska and the Northern Mariana Islands. The Census Bureau treats a municipality as equivalent to a county for data presentation purposes. The Bureau also treats the municipality (Anchorage) in Alaska as an incorporated place. This designation in Alaska is new for Census 2000. See borough, census area, city and borough, county.

Term	Abbreviation	Description
municipio		A type of governmental unit that is the primary legal subdivision of Puerto Rico. The Census Bureau treats municipios as the statistical equivalents of counties. See county equivalent and governmental unit.
must-hold boundary		A map feature that the Census Bureau agrees to recognize as the boundary of a tabulation census block. The purpose is to ensure that data are available for a specific geographic area because its component areas have been identified as unique census blocks.
National Academy of Sciences	NAS	U.S. government. The NAS is a private, nonprofit society of scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare.
National Archives and Records Administration	NARA	U.S. government. The NARA oversees the management of federal government records, including individual census records after 72 years, presidential diaries, historic correspondence, and a display of presidential gifts from around the world.
National Content Survey (1996)		One of the test censuses done as part of the planning and testing process for Census 2000. It was the principal vehicle for testing and evaluating subject content for Census 2000. It also provided information on questionnaire design and on mailing strategy and techniques to improve coverage.
National Institute of Standards and Technology	NIST	Department of Commerce. An organization under the Technology Administration. The NIST promotes United States economic growth by working with industry to develop and apply technology, measurements, and standards.
National Operations Center	NOC	The staff and facilities at the National Processing Center that served as one of the data capture centers for Census 2000.
National Processing Center	NPC	The permanent Census Bureau processing center in Jeffersonville, Indiana. It included the National Operations Center.
National Research Council	NRC	The council is the principal agency of the National Academy of Sciences for advising the government, the public, and the scientific and engineering communities.
National Technical Information Service	NTIS	Department of Commerce. An organization under the Technology Administration. The NTIS promotes the nation's economic growth and job creation by providing access to federally produced information for the public and production services to federal agencies.
National Telecommunications and Information Administration	NTIA	Department of Commerce. The NTIA is the executive branch's principal voice on domestic and international telecommunications and information technology issues.
New Construction Capture	NCC	This operation was conducted shortly before Census 2000. Local and tribal governments reported new living quarters built since the Local Update of Census Addresses (LUCA) operation.
New England county metropolitan area	NECMA	A county-based area designated by the federal Office of Management and Budget to identify metropolitan areas in New England.
no identification number	Non-ID	A response without a census identification number. The census identification number associates the response with a specific address in the master address file.

Term	Abbreviation	Description
non-city-style address		An address that does not use a house number and street name. This includes rural routes and highway contract routes, which may include a box number; post office boxes and drawers; and general delivery. See address, city-style address, mailing address, nondelivery area, and rural delivery area.
nondelivery area		An area in which the U.S. Postal Service does not deliver mail to homes, businesses, and the like. Instead, the residents must pick up their mail at a local post office, using either a post office box or drawer or general delivery. See city delivery area, noncity-style address, and rural delivery area.
nonfunctioning entity		A legal entity that cannot have elected or appointed officials to provide services or raise revenues. Such entities include administrative areas, such as voting districts, and areas from which people are elected to a legislative body, such as congressional districts and state legislative districts. Some counties and minor civil divisions are nonfunctioning entities. See legal entity.
nongovernmental organization	NGO	The partnerships developed during Census 2000 planning included national and local organizations and community groups. See partnerships.
nonresponse	NR	Housing units from which no questionnaire was returned by mail or from which a telephone response was not received.
nonresponse conversion operation	NRCO	A step in the Accuracy and Coverage Evaluation survey process during the person interviewing stage. At a cutoff date, all person interviewing cases are brought in from the field. The best interviewers are assigned to the unresolved cases. This is a last attempt to convert refusals to responses.
nonresponse follow-up	NRFU	The objective is to obtain a completed questionnaire from households for which a questionnaire was not received by mail or from which a telephone response was not received. A census follow-up operation in which temporary field staff, known as enumerators, visit the housing units in which these households reside.
nonsampling error		Errors that occur during the measuring or data collection process. Nonsampling errors can yield biased results when most of the errors distort the results in the same direction. Unfortunately, the full extent of nonsampling error is unknown. Decennial censuses traditionally have experienced nonsampling errors, most notably undercount, resulting from people being missed in the enumeration processes.
nonstreet feature		A natural or artificial part of the landscape, such as a stream, ridge, road, or power line. See feature, nonvisible feature, and visible feature.
nonvisible feature		A boundary of a legal entity, such as a county line, city limit, property line, and so forth. See feature, nonstreet feature, and visible feature.
occupied housing unit		A housing unit is classified as occupied if it is the usual place of residence of the person or group of persons living in it at the time of enumeration or if the occupants are only temporarily absent; for example, away on vacation. Occupied rooms or suites of rooms in hotels, motels, and similar places are classified as housing units only when occupied by permanent residents, that is, individuals for whom the facility is their usual place of residence.

Term	Abbrevia- tion	Description
Office of Management and Budget	OMB	U.S. government. The OMB's predominant mission is to assist the President in overseeing the preparation of the federal budget and to supervise its administration in Executive Branch agencies.
Office of Personnel Management	OPM	U.S. government. The OPM is the federal government's human resources agency.
operational test dry run	OTDR	A practice test of the data capture centers.
Operations Control System 2000	OCS/2000	This system was one of the decennial field interface systems and was used for control, tracking, and progress reporting for all field operations conducted for Census 2000, including production of materials used by field staff to do their work.
optical character recognition	OCR	Technology that uses an optical scanner and computer software to "read" human handwriting.
optical mark recognition	OMR	Technology that uses an optical scanner and computer software to scan a page, recognize the presence of marks in predesignated areas, and assign a value to the mark depending on its specific location and intensity on a page.
outlying areas		Obsolete term. See Island Areas.
overseas enumeration		Counts federal employees assigned overseas (including members of the Armed Forces) and their dependents, and persons on board United States military ships assigned to a foreign home port.
P-sample		People identified as nonmovers or out-movers and were residents of the A.C.E. survey housing unit on Census Day.
paper-assisted personal interview	PAPI	A method of data collection in which the enumerator uses a paper form to complete the interview.
parish		A type of governmental unit that is the primary legal subdivision of Louisiana, similar to a county in other states. See county equivalent and governmental unit.
Participant Statistical Areas Program	PSAP	A Census 2000 program that provided tribal and local officials with the opportunity to review and revise existing statistical areas and identify new ones. The program included census tracts, block groups, census designated places, and census county divisions. See statistical entity.
partition		A portion of the TIGER® database separated to effectively manage the size of that database in order to support operations such as updating, processing, and mapping of a specific part of the database. A partition usually consists of an entire county or statistically equivalent entity, but a county that has many records in the database may be divided into multiple partitions to allow the computer to process, and enable staff to work with, smaller files. For most operations, only one person at a time can access a partition. Also referred to as a county partition.
partnerships		Agreements with state, local, and tribal governments and community groups that gave these groups an opportunity to participate in various ways in Census 2000.
personal visit	PV	Face-to-face contact between a member of the public and an enumerator to obtain data.

Term	Abbreviation	Description
physical/location description		A short written description of the location and physical characteristics of a living quarters that does not have a house-number/street-name address. The description, together with the Census Bureau map showing the location of the map spot number for the living quarters, is intended to help Bureau staff recognize this living quarters in the field. (Note: After Census 2000, the Census Bureau changed this to “physical description,” relying on the location of the numbered map spot on the Census Block Map to identify the approximate site of each residential structure.)
place		A concentration of population either legally bound as an incorporated place or identified by the Census Bureau as a census designated place. See census designated place, incorporated place, legal entity, and statistical entity.
place of birth	POB	State or foreign country in which a person was born.
place of work	POW	The street address or location of a person’s current workplace.
planning database		A geographic database containing prior census housing, demographic, and socioeconomic variables correlated with nonresponse and undercounting data and used to identify specific geographic areas (for example, tracts) that could benefit from special enumeration methods to improve coverage.
Planning, Research, and Evaluation Division	PRED	Census Bureau. Provides technical expertise and executive leadership for planning future censuses and surveys. Coordinates policy and program related activities for future censuses and surveys.
political entity		See governmental unit and legal entity.
Population Division	POP	Census Bureau. Provides regularly updated information on the population of the United States and its demographic, geographic, and social characteristics. The division’s International Programs Center provides demographic and socioeconomic data on all major countries.
postal validation check	PVC	The U.S. Postal Service workers validate the master address file for addresses within the mailout/mailback area. Formerly called casing.
post-enumeration survey	PES	Evaluates coverage on a case-by-case basis using the Dual System Estimation methodology. Provides undercount information for detailed categories, such as renter/home owner and racial and ethnic group, which is not possible with demographic analysis. The Census 2000 Accuracy and Coverage Evaluation was a post-enumeration survey.
postmaster return	PMR	See undeliverable as addressed.
poststratum		The grouping of people within a particular stratum: for example, all white, non-Hispanic male renters ages 18–22 (poststratum) in a rural area (stratum).
Pre-Appointment Management System/Automated Decennial Administrative Management System	PAMS/ADAMS	An integrated structure of administrative management programs that supports applicant tracking and processing, background checks, selection records, recruiting reports, personnel and payroll processing, and archiving of historical data. This system was used in the hiring of temporary workers for Census 2000.
precanvass		See block canvassing.
prelist		See address listing.

Term	Abbreviation	Description
primary metropolitan statistical area	PMSA	A geographic entity designated by the federal Office of Management and Budget for use by federal statistical agencies. If an area meets the requirements to qualify as a metropolitan statistical area and has a population of 1 million or more, two or more PMSAs may be designated within it if they meet published statistical criteria and local opinion favors the designation. When PMSAs are designated within an MSA, the larger area of which they are components is designated a consolidated metropolitan statistical area. See statistical entity.
primary selection algorithm	PSA	Computer program applied to the decennial response file (DRF) to eliminate duplicate responses and to determine the housing unit record and the persons to include at the housing unit. After this procedure, the DRF is merged with the decennial master address file to create the census unedited file.
Privacy Act	PA	A 1974 act that places restrictions on the collection, use, maintenance, and release of information about individuals. It gives individuals the right to see records about themselves, to obtain copies of their records, to have records corrected or amended with agency approval, and to have a statement of disagreement filed in their records if the agency does not approve the correction or amendment.
Privacy Act notice		Form D-31 is a notice that advises persons of the authority under which the Census Bureau collects information, how it will use the information, and the effect of not answering a question.
production rate		A performance measure calculated as the number of cases completed within a specified time period: for example, cases completed per hour or cases completed per day.
Program for Address List Supplementation	PALS	This program was discontinued in 1997. It was created for Census 2000 to provide governmental units and regional and metropolitan agencies an early opportunity to submit lists of individual addresses for their communities to the Census Bureau for use in building the master address file.
program master plans	PMP	These documented all preparatory, field, processing, and statistical requirements for each major Census 2000 operation. The plans were coordinated by the Decennial Management Division program management staff.
Program Steering Committee	PSC	The PSC and the Management Integration Team provided the structure for the early planning of Census 2000 and were replaced by the Census Operational Managers, the Issue Resolution/Change Control Board, and the Decennial Division Chiefs Steering Committee.
pseudo-LCO		For Census 2000, where the land area under the authority of an American Indian tribe or the populated area of a military base was situated in more than one state or included widespread discontinuous parcels of land that could not satisfactorily be included within the boundary of a single local census office (LCO), the Census Bureau assigned such lands to the LCO that contained the administrative offices or headquarters of the tribe or base. As a result, each tribe or base worked with only one LCO for the census. The Census Bureau informally referred to the lands involved in the reassigned areas as pseudo-LCOs because they were not actually LCOs in their own right. Each pseudo-LCO was assigned a unique code; the first two digits were those of the regional census center (RCC) in which the pseudo-LCO was physically located and the last two digits were 66 through 89. Thus, an RCC could contain as many as 24 pseudo-LCOs.

Term	Abbreviation	Description
pseudo-tract		See interim census tract.
pseudo-voting district	pseudo-VTD	An area for which the Census Bureau reports voting district (VTD) data, even though the boundary of the actual VTD was adjusted by the reviewing officials so that it no longer matches the legally established boundary. Because the Census Bureau required that VTDs conform to census blocks for data presentation purposes, participants had to adjust some VTDs to use census block boundaries. Any VTD that was not identified by a participant as an actual VTD was shown with a "P" VTD indicator flag in the Census 2000 Redistricting Data (Public Law 94-171) Summary File. See voting district.
Public Information Office	PIO	Census Bureau. Manages relations with the news media, produces radio and video news releases, distributes daily newspaper clips of Census Bureau stories, administers the foreign visitors program, and writes and edits a variety of publications.
Public Law 94-171	P.L. 94-171	The public law requiring the Census Bureau to provide selected decennial census data tabulations to the states by April 1 of the year following the census. These tabulations are used by the states to redefine the areas included in each congressional district and the areas in other districts used for state and local elections, a process called redistricting.
Public Law 103-430	P.L. 103-430	The public law that amends Title 13, U.S. Code, to allow designated local and tribal officials access to the address information in the master address file to verify its accuracy and completeness. This law also requires the U.S. Postal Service to provide its address information to the Census Bureau to improve the master address file.
public use form	PUF	A form issued by a federal agency to obtain information from the public. A PUF that is to be administered to ten or more persons requires prior approval and clearance by the Office of Management and Budget.
public use microdata area	PUMA	A geographic entity for which the Census Bureau provides specially selected extracts of raw information from a small sample of long-form census records that have been screened to protect confidentiality of the census records. The extract files are referred to as public use microdata samples. For Census 2000, PUMAs, which must have a minimum census population of 100,000 and cannot cross a state line, received a 5 percent sample of the long-form records; these records were presented in state files. These PUMAs were aggregated to form "super-PUMAs," which required a minimum census population of 400,000 and received a 1 percent sample in a national file. (For the 1990 census, the 1 percent PUMAs needed a minimum census population of only 100,000, could cross state lines, and could cover areas that were different from the 5 percent PUMAs.) An area received both the 5 percent and 1 percent files when a super-PUMA coincided with a single PUMA. PUMAs for Census 2000 were delineated by state officials and comparable officials in the District of Columbia and Puerto Rico. As in 1990, the Census Bureau provided a 10 percent sample file each for Guam and the Virgin Islands. Data users can use these files to create their own statistical tabulations and data summaries. PUMAs were referred to as county groups for the 1980 and earlier censuses.
public use microdata sample	PUMS	Computerized files containing a small sample of individual long-form census records showing the population and housing characteristics of the people included on those forms. See public use microdata area.

Term	Abbreviation	Description
Puerto Rico	PR	See Island Areas.
Puerto Rico area office	PRAO	This is equivalent to a mini regional census center and has nine local census offices reporting to it.
quality assurance	QA	A systematic approach to build excellence into a process.
quality check		See Integrated Coverage Measurement.
quality control	QC	Using various statistical methods to validate that products meet standards.
questionnaire		The census or survey form on which a respondent or enumerator records information requested by the Census Bureau for a specific census or special survey.
Questionnaire Assistance Center	QAC	Centers established by local census offices to assist respondents in completing their questionnaires. Established in community centers, large apartment buildings, and so forth and staffed by volunteers and Census Bureau employees. See Walk-In Questionnaire Assistance Center.
<i>Questionnaire Reference Book</i>	QRB	This book provides detailed instructions to enumerators on how to fill out the census form.
Race and Ethnic Advisory Committees	REAC	An in-house term referring to the separate advisory committees on the race and ethnic populations. The original committees were the Census Advisory Committee on the African American Population, Census Advisory Committee on the American Indian and Alaska Native Populations, Census Advisory Committee on the Asian and Pacific Islander Populations, and Census Advisory Committee on the Hispanic Population. In 2000, the Asian and Pacific Islander Populations Committee became two committees—the Asian Advisory Committee and the Native Hawaiian and Other Pacific Islander Advisory Committee.
Race and Ethnic Targeted Test	RAETT	A test, conducted in 1996 in selected areas of the country, to evaluate alternative formats and sequencing of the race, Hispanic-origin, and ancestry questions.
ready for use	RFU	Indicates that the installation of hardware and software has passed testing and is ready for use.
reapportionment		The redistribution of seats in the U.S. House of Representatives among the states on the basis of the most recent decennial census as required by Article 1, section 2 of the Constitution. See apportionment, redistricting.
redistricting		The process of revising the geographic boundaries of areas from which people elect representatives to the U.S. Congress, a state legislature, a county or city council, a school board, and the like to meet the legal requirement that such areas be as equal in population as possible following a census. See apportionment, reapportionment.
Redistricting Data Program	RDP	A decennial census program that permits state officials to identify selected map features they want as block boundaries and specific areas, such as voting districts for which they need census data. See Block Boundary Suggestion Project, redistricting, voting district.
refusal		Reluctance by residents, apartment managers, local officials, or others to cooperate with census employees.
region (census geographic)		A grouping of states established by the Census Bureau for the presentation of census data. Each region (Northeast, South, Midwest, and West) is subdivided into divisions. See division (census geographic), statistical entity.

Term	Abbreviation	Description
regional census center	RCC	One of 12 temporary Census Bureau offices established to manage local census office activities and to conduct geographic programs and support operations, such as automated map production. The Census Bureau also operates an area office to manage census operations in Puerto Rico.
regional director	RD	The head of a regional office.
Regional Elected Officials Meeting	REOM	One of a series of regional meetings conducted by the Census Bureau with elected officials of local and state governments to encourage their support for Census 2000.
regional office	RO	One of 12 permanent offices established for the management of all census operations in an area that covers several million housing units.
regularly scheduled mobile food vans		Includes mobile food vans that are regularly scheduled to visit designated street locations for the primary purpose of providing food to people without housing. These are service locations. See service-based enumeration.
reinterview		The objective is to verify that enumerators collected accurate information. A sample of households in an assignment area is contacted again in person or by telephone. An enumerator re-asks certain questions and compares the answers to the original questionnaire. This verifies that the enumerator visited the correct address and that the questionnaire was completed accurately. This operation is performed in all areas after nonresponse follow-up and list/enumerate or rural update/enumerate.
reminder/thank you card		This is a postcard sent to addresses on the decennial master address file to remind respondents to return their census questionnaires or to thank them if they already have. All addresses in mailout/mailback areas receive a postcard. The Census Bureau conducts a blanket-mailing of these postcards to postal patrons (no addresses) in update/leave areas.
remote Alaska enumeration		List/enumerate is used for remote parts of Alaska. The unique aspect of remote Alaska enumeration is it begins in mid-February so enumerators can reach people living in remote locations before the spring thaw. After the spring thaw, travel to these areas is difficult. Questions are asked as of Census Day.
replacement questionnaire		A second questionnaire sent to addresses on the decennial master address file in mailout/mailback areas to increase mail response rates as part of the questionnaire mailing strategy. This was not used for Census 2000.
request for proposal	RFP	A government announcement in the <i>Commerce Business Daily</i> and on the Internet requesting vendors to propose a technical solution with costs for a statement of need or a statement of work. See statement of need, statement of work.
requirements initiative	RI	The documentation of business plans in support of expenditure of funds for acquisition of information technology products and services.
research and development	R&D	The R&D program for Census 2000 started in 1991 and ended in 1995.
research and experimentation	REX	The program of studies used to evaluate a census, to research new procedures and techniques, and to conduct experiments under true census conditions. For Census 2000, this program was referred to as Testing, Experimentation, and Evaluation.

Term	Abbreviation	Description
residence status		Each person in the coverage measurement sample block is assigned a residence status code identifying the person as either a resident or nonresident of the housing unit on Census Day.
Residential Finance Survey	RFS	This survey has been done every 10 years following the census since 1950. The survey collects information about the acquisition and financing of residential properties in the United States.
respondent		The person supplying survey or census information about his or her living quarters and its occupants.
restricted access building/secured building		An apartment building (that is, multiunit building) that can be entered only through doors that are locked to the public.
rural		Territory, population, and housing units not classified as urban constitute rural. The urban and rural classifications cut across other hierarchies; for example, there are generally both urban and rural territories within both metropolitan and nonmetropolitan areas.
rural delivery area		An area within which a post office delivers mail to residents living on rural delivery routes, as designated by the U.S. Postal Service. While many housing units in a rural delivery area use non-city-style addresses, some rural delivery routes include a substantial number that use house number and street name addresses. See city delivery area, city-style addresses, non-city-style addresses, and nondelivery area.
rural update/enumerate	RU/E	The enumerator attempts to update address lists and enumerate housing units for selected hard-to-enumerate rural areas. They also update and correct the census maps if needed.
sample census edited file	SCEF	A file containing 100 percent and sample characteristics for housing units and persons in the long-form sample. Processing for the SCEF includes merging the results of industry and occupation coding and place of work and migration coding, coding several other items, and weighting the long form responses.
sample census unedited file	SCUF	The decennial response file is combined with the decennial master address file to create the 100 percent census unedited file and the SCUF. The SCUF contains the unedited 100 percent items and sample items for all sample housing units and their residents and all sample persons in group quarters in Census 2000.
sample data		Detailed social, economic, and housing information collected on the long form from a selected portion of all housing units and people living in group quarters. The 1990 census sampled approximately 15 percent of the nation's population and 16 percent of its housing units. See 100 percent data.
sample edited detail file	SEDF	A file containing 100 percent and sample characteristics for housing units and persons in the long-form sample. The SEDF was used to create the Census 2000 sample data products and other tabulations based on the sample data.
sampling error		Errors that occur because only part of the population is directly contacted. With any sample, differences are likely to exist between the characteristics of the sampled population and the larger group from which the sample was chosen. Sampling error, unlike nonsampling error, is measurable.

Term	Abbreviation	Description
sampling stratum		A grouping or classification that has a similar set of characteristics based on the previous census.
school district	SD	A geographic area delineated by state, county, or local officials designating the school(s) that students in a particular locale must attend.
seasonal/recreational/occasional use		A housing unit held for occupancy only during limited portions of the year, such as a beach cottage, ski cabin, or time-share condominium.
self-enumerating places		Includes military facilities and group quarters, such as hospitals and prisons where the safety of the residents or the enumerators is a concern. A staff member of the facility lists the names of all people staying in each group quarters at the facility and prepares the Individual Census Report packets. A crew leader returns in a day or two to collect the completed materials. Note: Military Census Reports are used at military installations. See group quarters, Individual Census Report.
separate living quarters		Quarters in which the occupants live separately from any other individual in the building and which have direct access from outside the building or through a common hall. For vacant units, the criteria of separateness and direct access are applied to the intended occupants whenever possible.
service-based enumeration	SBE	An operation designed to enumerate people at service locations that primarily serve people without housing, such as emergency or transitional shelters; shelters for children who are runaways, neglected, or without conventional housing; shelters for abused women; soup kitchens; and regularly scheduled mobile food vans. The SBE also included enumeration at targeted nonsheltered outdoor locations. See service locations and targeted nonsheltered outdoor locations.
service locations		Locations where clients are enumerated during the service-based enumeration operation, such as emergency or transitional shelters; shelters for children who are runaways, neglected, or without conventional housing; shelters for abused women; soup kitchens; and regularly scheduled mobile food vans.
shelters for children who are runaways, neglected, or without conventional housing		Includes shelters/group homes that provide temporary sleeping facilities for juveniles. These are service locations. See emergency shelters; hotels, motels, or other facilities; regularly scheduled mobile food vans; service locations; soup kitchens; and transitional shelters.
Shipboard Census Report	SCR	A census questionnaire used for military and maritime (civilian) personnel aboard ships.
short form	SF	The decennial census questionnaire containing only the 100 percent questions. See 100 percent data, long form.
simplified enumerator questionnaire	SEQ	A questionnaire that enumerators use for transient, or T-Night, enumeration and when conducting the non-response follow-up. See nonresponse follow-up and T-Night enumeration.
single MIM-based integrated mapping system	SMIMS	A software system for creating the Map Image Metafiles (MIM).
Source Selection Evaluation Board	SEB	An evaluation group that evaluates proposals and selects the source for the contract award.

Term	Abbreviation	Description
soup kitchens		Includes soup kitchens, food lines, and programs distributing prepared breakfasts, lunches, or dinners. These programs may be organized as food service lines, bag or box lunches, or tables where people are seated, then served by program personnel. These programs may or may not have a place for clients to sit and eat the meal. These are service locations. See service-based enumeration.
special census		A federal census conducted at the request and cost of a local government to obtain population figures between decennial censuses.
special notice		A page in the address register to remind the enumerator of the confidentiality of the information being collected and to remind the enumerator to make legible entries.
special place	SP	A place containing one or more group quarters where people live or stay, such as a college or university, nursing home, hospital, prison, hotel, migrant and seasonal farm worker camp, or military installation or ship. See group quarters.
Special Place Facility Questionnaire	SPFQ	A questionnaire used to interview an official at a special place for the purpose of collecting/updating address information for the special place and any associated group quarters and housing units, determining the type of special place/group quarters, and collecting additional administrative information about each group quarters at the special place.
Special Place Facility Questionnaire operation		An operation where interviewers at telephone centers call each special place on the special place file and conduct computer-assisted telephone interviews to collect/update address information for the special place and any associated group quarters and housing units, determine the type of special place and any associated group quarters, and collect any additional information about each group quarters at the special place. If the interview cannot be completed by phone, an enumerator visits the facility to conduct the interview. See Special Place Facility Questionnaire.
special sworn status individual	SSS	Designation for a temporary employee hired to assist the Census Bureau on work authorized by Title 13 and subject to the same confidentiality requirements as regular Census Bureau employees. See confidentiality.
standard deviation		A measure of the dispersion of values in a frequency distribution from the average.
state		A type of governmental unit that is the primary legal subdivision of the United States. See governmental unit, state equivalent.
state certifying official	SCO	The official designated annually by the governor of each state and state equivalent to review and certify that the Census Bureau's inventory of local governmental units in that state is accurate and that the boundary changes were accomplished in accordance with state law. See Boundary and Annexation Survey.
state code		A two-digit code assigned by National Institute of Standards and Technology to identify each state and state equivalent. See census code, federal information processing standards code, geographic code.

Term	Abbrevia- tion	Description
state data center	SDC	A state agency or university facility identified by the governor of each state and state equivalent to participate in the Census Bureau's cooperative network for the dissemination of census data. An SDC also may provide demographic data to local agencies participating in the Census Bureau's statistical areas programs and may assist the Census Bureau in the identification and delineation of statistical areas.
state-designated American Indian statistical area	SDAISA	A new program offered by the Census Bureau to the states for state-recognized American Indian tribes without a land base. A state government liaison can review and update the boundaries for these geographic areas, and the Census Bureau provides data for these areas.
state equivalent		A type of governmental unit treated by the Census Bureau as if it were a state for purposes of data presentation. For Census 2000, the state equivalents included the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands of the United States, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. See governmental unit, Island Areas, state.
state legislative district	SLD	The area represented by a member of the upper or lower chamber of a state legislature (or, for Nebraska, its unicameral legislature).
statement of need	SON	A description of the services and/or final product solicited by the government. See statement of work.
statement of work	SOW	A description of the objectives and/or tasks required to be accomplished as a part of a request for proposals or in a contract for professional services. See statement of need.
statistical entity		Any specially defined geographic entity, such as a metropolitan area, urbanized area, tribal designated statistical area, census county division, census designated place, census tract, block group, or census block, for which the Census Bureau tabulates data. Statistical entity boundaries are not legally defined, and the entities have no governmental standing. See legal entity.
Statistical Research Division	SRD	Census Bureau. Conducts statistical and methodological research motivated by practical problems arising in all phases of data collection, processing, and dissemination.
street segment		The portion of a street or road between two features that intersect that street/road, such as other streets/roads, railroad tracks, streams, and governmental unit boundaries.
subbarrio		The primary legal subdivision of a barrio or barrio-pueblo (minor civil division) in 23 municipios in Puerto Rico. Census 2000 provides the same types of data for subbarrios as it does for barrios and barrios-pueblo. See sub-MCD.
sub-MCD		A legal subdivision of a minor civil division (MCD). For Census 2000, only Puerto Rico has sub-MCDs (subbarrios).
tabulation block		A physical block that does not have any legal or statistical boundaries passing through it OR each portion of a physical block after the Census Bureau recognizes any legal or statistical boundaries that pass through it. See block, block number, collection block.
tabulation geography		The geographic entities for which the Census Bureau tabulates and presents data, such as the United States, American Indian and Alaska Native areas, states, counties, county subdivisions, places, congressional districts, metropolitan areas, census tracts, and census blocks. See collection geography, geographic entity.

Term	Abbreviation	Description
targeted canvassing		Used in the Census 2000 Dress Rehearsal. Replaced by block canvassing.
targeted mailing		The mailing of replacement questionnaires is targeted to nonrespondents, that is, households that did not return a completed questionnaire by a certain time.
targeted map update		An operation where census employees (updaters) go into the field to find the city-style address ranges that the regional offices and regional census centers (RCCs) were unable to resolve during Automated Master Address File Geocoding Office Resolution. The updaters identify the streets and address ranges by annotating census maps and lists of uncoded address ranges. They return the maps and lists to the RCCs, and the RCCs insert the information into the TIGER® database and flag errors in the master address file. The computer matches and geocodes the addresses. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, census map preview, TIGER®, and TIGER® Improvement Program.
targeted multiunit check		Used in the Census 2000 Dress Rehearsal. Replaced by block canvassing.
targeted nonsheltered outdoor location	TNSOL	A geographically identifiable outdoor location open to the elements where there is evidence that people might be living without paying to stay there and those people do not usually receive services at soup kitchens, shelters, and mobile food vans. Sites must have a specific location description that will allow a census enumeration team to physically locate the site; for example, “the Brooklyn Bridge at the corner of Bristol Drive” or “the 700 block of Taylor Street behind the old warehouse.” Excludes pay-for-use campgrounds, drop-in centers, post offices, hospital emergency rooms, and commercial sites (including all-night theaters and all-night diners). See service-based enumeration.
targeting database		See planning database.
Technologies Management Office	TMO	Census Bureau. Develops and implements computer-assisted data collection and related support operations. Oversees the development of automated instruments for computer-assisted interviewing applications. Serves as liaison with production software contractors.
telephone follow-up	TFU	Telephone contact from a district office or a processing office to occupied housing units to complete or correct inadequate data for mail return questionnaires that failed the edit.
Telephone Questionnaire Assistance	TQA	A toll-free service that was provided by a commercial phone center to answer questions about Census 2000 or the census questionnaire and to conduct short-form telephone interviews.
Telephone Questionnaire Assistance field verification		An operation to verify the existence and the residential status of addresses given to the Census Bureau from the Telephone Questionnaire Assistance operation. Addresses verified by a field enumerator were added to the master address file.
tenure		All occupied housing units are classified as either owner-occupied or renter-occupied.
test census		A partial or complete census of population and housing that the Census Bureau conducts in selected areas prior to a decennial census to test the validity and effectiveness of a variety of operations, including alternatives.

Term	Abbreviation	Description
TIGER® Improvement Program	TIP	The TIGER® (Topologically Integrated Geographic Encoding and Referencing) Improvement Program provides all local governments and regional and metropolitan agencies the opportunity to assist the Census Bureau in locating and updating street features, street names, and address ranges identified as missing or incorrect in the TIGER® database. This information is needed to link U.S. Postal Service addresses with the TIGER® database. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, census map preview, digital exchange file, geocode, targeted map update, TIGER®.
TIGER/Line® file		The computer-readable extract of the TIGER® (Topologically Integrated Geographic Encoding and Referencing) database that the Census Bureau makes available to the public. It contains data representing the roads, railroads, bodies of water, boundaries of legal and statistical entities, and other visible and nonvisible features, along with their attributes (names, address ranges, geographic codes, census feature class codes, and the like).
Title 13 (U.S. Code)	T-13	The law under which the Census Bureau operates and that guarantees the confidentiality of census information and establishes penalties for disclosing this information.
tool kit		Special census methods and procedures available for improving cooperation or enumeration in hard-to-enumerate areas. These are not normally scheduled operations but are available to the Census Bureau regional offices for use as needed. Examples: targeting database, team and blitz enumeration, and urban update/leave.
Topologically Integrated Geographic Encoding and Referencing	TIGER®	A computer database that contains a digital representation of all census-required map features (streets, roads, rivers, railroads, lakes, and so forth), the related attributes for each, and the geographic identification codes for all entities used by the Census Bureau to tabulate data for the United States, Puerto Rico, and Island Areas. The TIGER® database provides a resource for the production of maps, entity headers for tabulations, and automated assignment of addresses to a geographic location in a process known as “geocoding.” TIGER® was preceded by the GBF/DIME (Geographic Base File/Dual Independent Map Encoding) files. See Automated Master Address File Geocoding Office Operation, Boundary and Annexation Survey, census map preview, digital exchange file, geocode, targeted map update, TIGER® Improvement Program.
touchtone data entry	TDE	An automated data capture technology that allows a respondent, using the keypad of a touchtone telephone, to reply to computer-generated prompts.
town		A type of minor civil division in the New England states, New York, and Wisconsin and a type of incorporated place in 30 states and the Virgin Islands of the United States. See county subdivision, governmental unit, incorporated place.
township		A type of minor civil division in 16 states. In some states, many or all townships are nonfunctioning entities. In Michigan, some townships are legally designated as “charter townships.”

Term	Abbreviation	Description
tract		Small, relatively permanent statistical subdivisions of counties delineated by local committees of census data users in accordance with Census Bureau guidelines for the purpose of collecting and presenting decennial census data. These neighborhoods contain between 1,000 and 8,000 people, typically approximately 1,700 housing units and 4,000 people. Tracts are designed to have homogeneous population characteristics, economic status, and living conditions at the time they are established. Census tract boundaries normally follow visible features but may follow governmental unit boundaries and other nonvisible features. There were more than 60,000 census tracts in 2000. See statistical entity, census statistical areas committee.
tract number		Used to uniquely identify a census tract within a county.
traffic analysis zone	TAZ	An area defined by a metropolitan planning organization for tabulating transportation statistics from the census.
transient location		Includes living quarters with people who have no usual home elsewhere who were enumerated during Transient Night, or T-Night, enumeration at YMCAs, YWCAs, hostels, commercial and government-run campgrounds, campgrounds at racetracks, fairs, carnivals, and marinas. Census enumerators complete a simplified enumerator questionnaire for the residents who do not have a home elsewhere. These locations are classified as housing units.
Transient Night or T-Night, T-Night enumeration	T-NIGHT, TNE	A method of enumeration in which Census Bureau staff enumerate people at transient locations, such as campgrounds at racetracks, recreational vehicle campgrounds or parks, commercial or public campgrounds, fairs and carnivals, and marinas. Enumerators conduct a personal interview using a simplified enumerator questionnaire. No vacant units are generated by this operation. See simplified enumerator questionnaire, transient location.
transitional shelters		Includes shelters providing a maximum stay for clients of up to 2 years and offering support services to promote self-sufficiency and to help clients obtain permanent housing. These are service locations. See service locations.
tribal block group		A block group within a tribal census tract. Where a census tract numbered in the 9400 series crosses a county line, the same tribal block group may be located on both sides of that boundary. See block group, tribal census tract.
tribal census tract		A census tract or portion of a census tract located within a federally recognized American Indian reservation and/or off-reservation trust land. Thus, the boundary of a federally recognized American Indian reservation and off-reservation trust land is always a tribal census tract boundary. Some of these census tracts are numbered in the 9400 series, primarily where they cross a county line. See census tract, tribal block group.
tribal designated statistical area	TDSA	An area identified outside Oklahoma by federal- and state-recognized tribes without a land base or associated land trust.
tribal jurisdiction statistical area	TJSA	An area identified by Oklahoma tribal officials as containing the American Indian population over which they have jurisdiction.

Term	Abbrevia- tion	Description
Tribal Review Program		A program in 1997 and 1998 to allow officials of all federally recognized American Indian and Alaska Native entities to review and update the maps for Census 2000 for their jurisdictions. Other programs involving map review for the American Indian/Alaska Native areas include Address List Map Review, Block Definition Project, Boundary and Annexation Survey, census map preview, and Local Update of Census Addresses.
turnover rate		The total number of workers who quit during a field operation divided by the total number of workers hired for that operation.
type of enumeration area	TEA	A classification identifying how the Census Bureau takes the decennial census of a geographic area. Examples of possible TEAs include: <ul style="list-style-type: none"> ▪ The area inside the “blue line.” For 2000, this was the mailout/mailback and urban update/leave operations. ▪ Address listing areas. ▪ List/enumerate areas. ▪ Remote areas of Alaska. See address listing, blue line, list/enumerate, mailout/mailback, rural update/enumerate, update/leave, urban update/leave.
undeliverable as addressed	UAA	A U.S. Postal Service notification that a mailing piece could not be delivered to the designated address. Formerly called a postmaster return.
unorganized territory	UT	The portion of a county that is not included in any legally established minor civil division (MCD) or incorporated place in a state in which the Census Bureau recognizes MCDs for purposes of decennial census data presentation. For purposes of data presentation, the Census Bureau may divide a large area of unorganized land into several UTs. See county subdivision, statistical entity.
update/enumerate	U/E	A method of enumeration in which enumerators update the mailing list obtained by address listing and other operations, update census maps, and simultaneously enumerate the area. For enumeration, they canvass selected blocks and pick up completed, unaddressed questionnaires previously left by a mail carrier or complete a census questionnaire for each occupied and vacant housing unit. For Census 2000, the Census Bureau implemented this methodology primarily in areas designated for rural update/enumerate. See rural update/enumerate, type of enumeration area, update/leave.
update/leave	U/L	A method of data collection in which the objective is to update the address register while delivering questionnaires. Enumerators personally deliver a census questionnaire to a household and at the same time update the address list and census maps. The household completes and returns the form by mail. This method is primarily used for houses without city-style addresses. See address listing, city-style address, list/enumerate, mailout/mailback, non-city-style address, type of enumeration area, rural update/enumerate.
urban		All territory, population, and housing units in urbanized areas and in places of 2,500 or more persons outside urbanized areas. The urban and rural classifications cut across other hierarchies; for example, there are generally both urban and rural territories within both metropolitan and nonmetropolitan areas.

Term	Abbreviation	Description
urban cluster	UC	A densely settled area that has a census population of 2,500 to 49,999. A UC generally consists of a geographic core of block groups or blocks that have a population density of at least 1,000 people per square mile, and adjacent block groups and blocks with at least 500 people per square mile. It may include less densely settled blocks that form enclaves or indentations or that connect discontinuous areas that have qualifying densities. A UC consists of territory outside of any place; all or part of one or more incorporated places and/or census designated places; or such a place(s) together with adjacent territory. See central place, extended place, urban, urbanized area. NOTE: Any urban area delineated in Guam is classified as an urban cluster regardless of its population size.
urban growth area	UGA	In Oregon, an "urban growth boundary" is delineated around each incorporated place or a group of incorporated places by state and local officials, and subsequently confirmed in state law, to control urban development. The Census Bureau refers to the resulting geographic entities as "urban growth areas." UGAs were new for Census 2000. ("Urban growth boundary" is a legal term; "urban growth area" is a Census Bureau term.)
urban update/enumerate	UU/E	A method of enumeration within mailout/mailback areas in selected cities to enumerate blocks occupied almost entirely by boarded-up structures. The objective is to update the address register while delivering questionnaires. Enumerators complete a census questionnaire for each occupied and inhabitable housing unit, and update the address register and the census maps. The Census Bureau did not use this type of enumeration in Census 2000.
urban update/leave	UU/L	Update/leave procedures are used in targeted urban areas where mail delivery may be a problem, such as an apartment building where the mail carrier may leave the forms in a common area. Enumerators deliver census questionnaires for residents to complete and mail back, update the address register, and update the census maps.
urbanized area	UA	An area, consisting of one or more places and the adjacent urban fringe, containing at least 50,000 people and an overall population density of at least 1,000 people per square mile of land. The Census Bureau uses published criteria to determine the qualification and boundaries of UAs. See statistical entity.
U.S. Postal Service	USPS	The organization responsible for delivering the mail questionnaires in Census 2000 and the producer of the delivery sequence file.
usual home elsewhere	UHE	A housing unit that is temporarily occupied by a person(s) who has a usual home elsewhere.
usual residence		The living quarters where a person spends more nights during a year than any other place.

Term	Abbreviation	Description
vacant housing unit		A housing unit is vacant if no one is living in it at the time of enumeration, unless the occupants are only temporarily absent. Units temporarily occupied at the time of enumeration entirely by individuals who have a usual residence elsewhere are classified as vacant. (Transient quarters, such as hotels, are housing units only if occupied. Thus, there are no vacant housing units at hotels and the like.) New units not yet occupied are classified as vacant housing units if construction has reached a point where all exterior windows and doors are installed and final usable floors are in place. Vacant units are excluded from the housing unit inventory if they are open to the elements. Also excluded from the housing unit inventory are units with a posted condemnation sign or units that are used entirely for nonresidential purposes.
vacant housing unit follow-up		The verification of the occupancy status of all cases originally identified by either the U.S. Postal Service or an enumerator as addresses without occupants or addresses that are no longer housing units.
village		A type of incorporated place in 20 states and American Samoa. The Census Bureau also treats all villages in New Jersey, South Dakota, and Wisconsin and some villages in Ohio as county subdivisions. See governmental unit, incorporated place.
visible feature		A feature that can be seen on the ground, such as a street or road, railroad track, power line, stream, shoreline, fence, ridge, or cliff. A visible feature can be a manmade or natural feature. See feature.
voice recognition entry	VRE	An automated data capture technology that allows a respondent, speaking over a telephone, to reply to computer-generated prompts.
voting district/legislative district	VTD	Any of a variety of types of areas, such as election districts, precincts, wards, and legislative districts, established by state and local governments for purposes of elections.
Walk-In Questionnaire Assistance Center		Places, such as post offices, libraries, stores and malls, schools and community centers, and other sites people frequent, where unaddressed questionnaires, called Be Counted forms, were offered in an attempt to ensure everyone had the opportunity to be counted. The centers were staffed by volunteers and Census Bureau employees.
whole household usual home elsewhere	WHUHE	See usual home elsewhere.
wide area network	WAN	A group of computers linked within a network, such as the Census Bureau's regional offices, to exchange and share information. Whereas a "local area network" may link computers within a building or among several buildings, a WAN covers more area and distance. See local area network.
work breakdown structure	WBS	A way of organizing a project by a hierarchy of its components. The master activity schedule was organized by a WBS with 13 components or major programs. All Census 2000 program documentation and planning was keyed to this.
ZIP + 4		A 4-digit code following a 5-digit ZIP Code established by the U.S. Postal Service for the purpose of expediting mail delivery. The 9-digit code generally identifies one side of a street segment or an entire cul-de-sac or similar dead-end street.

Term	Abbreviation	Description
ZIP Code	ZIP	ZIP Codes are administrative units established by the U.S. Postal Service for the distribution of mail. ZIP stands for zone improvement plan. It is a 5-, 7-, 9-, or 11-digit code assigned by the U.S. Postal Service to a street or portion of a street, a collection of streets, a business, or other establishment or structure, or a group of post office boxes to expedite the delivery of mail. The Census Bureau used only 5-digit ZIP Codes for the addresses and address ranges in most Census 2000 operations.
ZIP Code area		The addresses served by a 5-digit ZIP Code established by the U.S. Postal Service to expedite the delivery of mail. Most ZIP Codes do not have specific boundaries, and their implied boundaries do not necessarily follow clearly identifiable visible or invisible map features; also, the carrier routes for one ZIP Code may intertwine with those of one or more other ZIP Codes, and therefore this “area” is more conceptual than geographic. See ZIP + 4, ZIP Code, ZIP Code tabulation area.
ZIP Code tabulation area	ZCTA	A statistical entity developed by the Census Bureau to approximate the delivery area for a U.S. Postal Service 5-digit ZIP Code in the United States and Puerto Rico. A ZCTA is an aggregation of one or more census blocks that have the same predominant ZIP Code associated with the mailing addresses in the Census Bureau’s master address file. Thus, the Postal Service’s delivery areas have been adjusted to encompass whole census blocks so that the Census Bureau can tabulate census data for ZCTAs. For areas larger than 25 square miles for which the Census Bureau’s master address file contained no addresses with ZIP Codes, the Census Bureau used the first 3 digits of the ZIP Code(s) that serve the area or a nearby area. For the dress rehearsal data, there were two blank spaces after such 3-digit codes; for Census 2000, there was a suffix of “XX.” A water feature that could not logically be assigned to a specific ZCTA got assigned a 3-digit code followed by “HH” to indicate that the water feature could not be assigned meaningfully to any adjacent land ZCTA. ZCTAs do not include all ZIP Codes used for mail delivery. The Census Bureau first created ZCTAs for the Census 2000 Dress Rehearsal. See ZIP Code, ZIP Code area.
zona urbana	ZU	In Puerto Rico, an area consisting of the municipio seat of government and the adjacent built-up area. ZUs are delineated like census designated places, except that ZUs cannot cross municipio boundaries. ZUs have never had to meet a minimum population threshold to qualify for tabulation of census data, a criterion that for Census 2000 applied for the first time to all census designated places. See census designated place, comunidad.