



Improving
Our Measure
of America:

What Census 2000 Can Teach Us in Planning for 2010



MESSAGE FROM THE Inspector General

This document represents a departure from the reports typically issued by the Office of Inspector General. Rather than detailing the outcome of a program audit or inspection, it shares the lessons we have gleaned from years of monitoring and assessing the preparation for and execution of Census 2000. Our purpose in issuing this report is straightforward: to create a document that is timely, meaningful, and user-friendly for stakeholders in the decennial process and that offers guidance for improving census planning and operations. In pursuing this goal, we endeavored to consider the perspectives and experiences of people and organizations involved in or impacted by the decennial:

- We listened to the concerns and insights of Census Bureau officials and Department of Commerce managers who are ultimately responsible for making the decennial happen.
- We conferred with field enumerators and managers—the front-line census-takers—to learn about the successes they achieved, the challenges they faced, and the obstacles that remain to be overcome.
- We talked with congressional members and staff, as well as state and local elected officials, for whom the political stakes of census outcomes are so high.
- We sought input from census experts both within and outside the government regarding the key components of effective census operations and the major pitfalls that threaten the process.

We evaluated this feedback in light of the needs and interests of those who are ultimately most impacted by the decennial process—American citizens—knowing that it is the responsibility of the government in conducting the decennial to ensure that their interests are protected. Our hope is that the lessons contained herein will aid in the development and execution of decennial censuses that accomplish these objectives as efficiently and effectively as possible.

This report identifies what we view as the 10 most important lessons learned during the course of the decennial and is organized according to those lessons. While we provide suggestions for improvement, this is not a report to which the Bureau of the Census is required to formally respond. It is our hope that this document will serve as a useful tool for 2010 census planning. We look forward to working with Census staff and managers, Commerce officials, and other involved parties as the Census Bureau moves to develop strategies for a successful 2010 decennial census.



Johnnie E. Frazier,
Inspector General

Contents

EXECUTIVE SUMMARY	iii
--------------------------	------------

INTRODUCTION	1
---------------------	----------

LESSONS LEARNED	5
------------------------	----------

LESSON 1: Reach Early Consensus on the 2010 Design to Facilitate Effective Planning and Obtain Sufficient Funding	5
--	----------

LESSON 2: Produce Accurate, Complete Address Lists and Maps	11
--	-----------

LESSON 3: Conduct a Carefully Targeted and Aggressive Public Awareness Campaign	13
--	-----------

LESSON 4: Strengthen Quality Control of Nonresponse Follow-up	15
--	-----------

LESSON 5: Implement Clear Policies and Guidance for Managing Temporary Staff	17
---	-----------

LESSON 6: Determine Whether Sampling Has a Role Beyond Measuring Coverage	19
--	-----------

LESSON 7: Implement Rigorous System and Software Development Processes and Effective Information Security Measures	21
---	-----------

LESSON 8: Upgrade and Maintain Contracting and Program Management Expertise	25
--	-----------

LESSON 9: Generate Timely, Accurate Management and Operational Information	29
---	-----------

LESSON 10: Mitigate Potential Disruptions and Distractions to the Work Environment and Workforce	33
---	-----------

CONCLUSION	34
-------------------	-----------

NOTES	35
--------------	-----------

REFERENCES	37
-------------------	-----------

Executive Summary

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Costly, complex, and high risk are terms used to describe Census 2000. Yet operationally, most agree that this decennial census was a success—participation was higher than anticipated, especially among the historically undercounted, and operations concluded on time. Now the Bureau must determine how to capture its successes, improve areas of weakness, and anticipate emerging challenges as it plans for Census 2010.

The Office of Inspector General monitored aspects of the Bureau's planning and conduct of Census 2000. We issued more than 30 reports and special memorandums; held numerous discussions with headquarters officials and field managers; reviewed hundreds of questionnaires, reinterview forms, and management and financial reports; examined the Bureau's address file; and traveled to local

census offices throughout the country to evaluate various field operations.

This report summarizes the highlights of some of our work and organizes our findings around 10 basic lessons learned. We believe that discussing these issues in conjunction with the findings of the Bureau's own internal evaluations and the analyses of others will result in sound guidance for planning and conducting Census 2010.

“The actual enumeration shall be made ...within every subsequent term of ten years...”

UNITED STATES CONSTITUTION

Lesson 1: Reach Early Consensus on the 2010 Design to Facilitate Effective Planning and Obtain Sufficient Funding

An undertaking as huge and complex as the decennial census requires long lead times to allow for proper development and testing of the overall design and to define and procure systems.

Therefore, an agreed-upon design with sufficient funding to support its development must be in place early. The drawn-out dispute over sampling precluded early agreement on Census 2000's design and increased problems in its execution.

Our review of the Bureau's readiness to conduct the 2000 decennial revealed that as late as 1995 Census still did not have a design that was sufficiently finalized to undergo full-scale testing. In 1998, as the dress rehearsal approached, many in Congress were opposed to the use of sampling and required the Bureau to test two census designs—one that relied on sampling and one that did not. A final decision on the design did not come until 1999, when the United States Supreme Court ruled that sampling could not be used to apportion the House of Representatives, in effect, telling Census that it must concentrate on the traditional approach of enumerating every household in the nation.

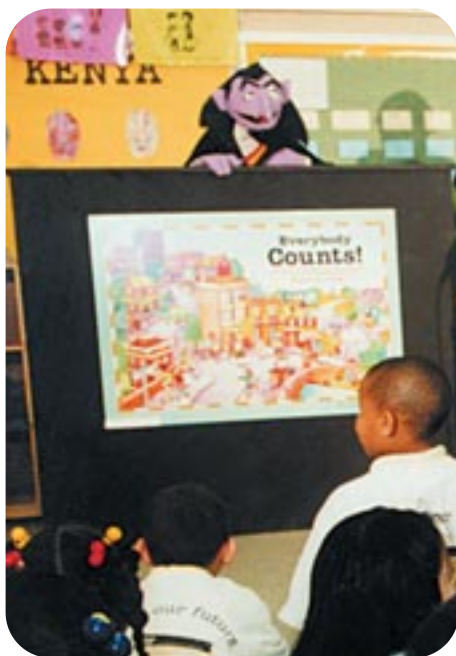
Improving Our
Measure of America:

**What
Census 2000
Can Teach Us in
Planning for
2010**

Eager to avoid the design-related problems experienced during Census 2000, the Bureau is already developing its plan for 2010, which includes a reengineered address file and associated maps, as well as a design that collects data using only the short form. The Bureau intends to replace the decennial long form with data collected from a continuous measurement system called the American Community Survey (ACS). We commend the Bureau for these early planning efforts, but are concerned about its intention to rely on this new design because of the uncertainty of funding for it: if the Bureau does not receive sustained ACS funding throughout the decade, it may be unable to eliminate the long form for 2010. We believe that Census's plan for the next decennial should (1) standardize the long-form and ACS questionnaires so that they are compatible in content and layout; sample design; and data collection, capture, and processing methods and technologies; and (2) include a contingency plan for use of the long form.

Lesson 2: Produce Accurate, Complete Address Lists and Maps

Knowing where the nation's people are and how to reach them is fundamental to the decennial census. The Master Address File (MAF) is the Bureau's primary tool for accomplishing this task. Accuracy and completeness are vital to the reliability of the MAF and associated maps; hence, the Bureau's ongoing planning must include special efforts to create a more reliable address file and mapping system. Over the course of the last decade, we issued several reports on these critical operations, including some that identified numerous problems with the MAF, such as missing, duplicate, and inaccurate addresses, and noted that maps were often neither current nor drawn to appropriate scale. To help avoid these problems in the next decennial, the Bureau should continue working to improve the MAF and mapping system throughout the decade, establishing performance measures for accuracy and completeness, testing against these goals, and reporting to decision-makers on the progress made toward meeting performance objectives.



Lesson 3: Conduct a Carefully Targeted and Aggressive Public Awareness Campaign

The Bureau had set goals for Census 2000 of increasing public awareness and improving the mail response rate. To achieve these goals, Census conducted a two-part publicity campaign: (1) national paid advertisements began 6 months before census forms were mailed out; and (2) partnerships between the Bureau and state and local organizations developed community-specific initiatives to publicize the decennial. Both components were designed to educate individuals about the census and encourage them to return census forms. The 2000 response rate of 67 percent surpassed that of 1990 (65 percent) and far exceeded the projected rate of 61 percent. Considering the general downward trend in return rates from one census to the next, we commend the Bureau for having done an excellent job in motivating the American public to participate. The higher-than-anticipated response rate in 2000 reduced the cost of the decennial because enumerators had to visit fewer households for nonresponse follow-up.

We reviewed the Bureau's public awareness campaign prior to kickoff of the 2000 decennial and found that the advertising message was developed using a sound methodology and that the partnership effort had resulted in a comprehensive, effective nationwide program of education aimed at increasing the mail response rate and thereby reducing the undercount. Given the apparent success of these programs at getting people to respond, we believe the Bureau should incorporate similar components into its 2010 decennial design.

Lesson 4: Strengthen Quality Control of Nonresponse Follow-up

For 2010, Census must do a better job of overseeing data collection at each local office to avoid costly reenumeration and ensure the public's confidence in census results. More specifically, the Census Bureau needs to improve its quality assurance efforts to better identify falsified information. Falsified data submitted by enumerators threatens the integrity of the entire census and, when identified, results in the costly exercise of having to reenumerate the affected area. Highly questionable data and shortcuts used to collect census information were problems at a number of local census offices, particularly at three Florida locations, where suspect data required the Bureau to reenumerate much of their coverage areas. The negative publicity surrounding these events raised the public's concern about the accuracy of the census.

Lesson 5: Implement Clear Policies and Guidance for Managing Temporary Staff

The Bureau hired more than 950,000 temporary workers to conduct various field operations at its 520 local census offices. Hiring and managing large numbers of temporary employees was a challenge for all these offices, and created some significant problems at a few. Although the task of recruiting, training, and effectively managing a large number of people during the decennial census is inherently difficult, our findings and observations suggest nonetheless that the process can be improved. The Bureau needs to examine and strengthen personnel policies and procedures regarding such matters as employee safety, overtime, termination for cause, and reassignment of staff among census offices.



Lesson 6: Determine Whether Sampling Has a Role Beyond Measuring Coverage

The proposed use of sampling to improve coverage was perhaps the most controversial aspect of Census 2000. In 1999, after the United States Supreme Court ruled that census results derived from sampling could not be used to apportion the House of Representatives, the Bureau proceeded with sampling operations for other potential uses, such as the allocation of federal funds. The Bureau initially believed it could improve the accuracy of census counts by adjusting them via sampling. But extensive data analysis has not demonstrated that the statistically adjusted counts are more accurate than the unadjusted ones. As early as possible for 2010, we believe the Bureau must determine whether sampling has a purpose beyond providing a quality check to measure coverage.

Lesson 7: Implement Rigorous System and Software Development Processes and Effective Information Security Measures

The Bureau needs to strengthen its management of information technology resources and its approach to software development. Data collected from the decennial must be processed within severe time constraints, and results must be accurate. During Census 2000, the Bureau often used an *ad hoc* approach to software development that provided inadequate controls, insufficient testing, and poor or no documentation. In several instances, these unsystematic methods led to disruptive errors that had to be corrected as the census was being conducted.



In addition, with the inevitable expansion of Internet use and the Bureau's plans to increase electronic transmission of census questionnaire data, information security will be even more critical in 2010. Title 13 of the U.S. Code prohibits the Census Bureau from disclosing data it collects about individuals and establishments. Unintentional disclosure of this data could seriously damage the decennial by undermining confidence in the Bureau's ability to keep information confidential and thus diminishing the public's willingness to respond. The Bureau, with its unique mission, must incorporate strong security mechanisms that will safeguard its census-related computer systems and networks from unauthorized access and its data from unauthorized disclosure or modification.

Lesson 8: Upgrade and Maintain Contracting and Program Management Expertise

For Census 2000, the Bureau contracted out various important projects including development and operation of its largest, most complex IT systems, and its advertising campaign. However, it did not have sufficient contracting and program management staff with the training and experience to most efficiently acquire systems and manage complex, high dollar contracts. Ultimately, the contracts supported decennial census operations but in many instances, they did so at a higher cost than necessary. For 2010, when contractors will likely play a larger role, the Bureau must have a sufficient number of highly skilled and properly trained personnel who are dedicated to the planning and management of decennial contracts.

Lesson 9: Generate Timely, Accurate Management and Operational Information

In a program as time sensitive as the decennial census, the importance of having timely and accurate information about management activities and operational functions cannot be overstated. Without such data, Census management is unable to effectively oversee and evaluate performance, make informed management decisions, and improve the execution of future censuses. For example, the Bureau failed to track and analyze proxy questionnaire data—thus depriving itself of a critical management tool for assessing the integrity of nonresponse follow-up operations. Had the Bureau

monitored proxy data, perhaps it would have recognized enumeration irregularities in Hialeah, Florida, where the local census office sanctioned inappropriate use of proxy questionnaires and abused other procedures. As a result of these actions, Census had to completely reenumerate the Hialeah district. The number of LCOs that allowed similar improprieties will never be known because data from proxy questionnaires was unavailable during the nonresponse follow-up operation. In 2010, the Bureau must closely monitor this data collection operation to avoid repetition of these abuses.

Providing timely information to the unprecedented number of organizations that tracked the progress of the census, including GAO, the Census Monitoring Board, and our office, also proved difficult. For 2010, the Bureau should be prepared for the scrutiny and interest of outside parties and should therefore establish procedures for providing them with accurate, timely data while the decennial is being conducted.

Lesson 10: Mitigate Potential Disruptions and Distractions to the Work Environment and Workforce

Although the decennial is the Bureau's most costly and labor-intensive function, Census has other important initiatives and responsibilities that it must handle as well. The Bureau must be prepared to overcome challenges that affect all of its operations. Time and again, the Bureau has proven its ability to do so, and its handling of one potential problem for the 2000 decennial showed particular foresight. The Bureau needed to hire nearly 1 million temporary employees to support decennial operations at a time when unemployment was at historically low levels. Concerned that it would have difficulty hiring sufficient personnel, the Bureau increased wage levels across the country. As a result of this and other efforts, Census successfully hired enough temporary workers.

During this decade of preparation for 2010, Census must handle at least two major challenges that could impact decennial activities: (1) the Bureau could lose, through retirement, up to half of its current decennial staff. As soon as possible it must have strategies in place to retain institutional knowledge and expertise so as to ensure the smooth continuity of decennial management and operations. (2) census is scheduled to move into its new headquarters building in 2008. Given the timing of the move, which is set for the same year as the planned dress rehearsal, and the frequent delays associated with many construction projects, the Bureau must have a solid relocation plan to minimize disruptions to its operations, and to identify and ameliorate potential problems while keeping costs in check and decennial preparations on track.

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Introduction

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The Office of Inspector General has issued more than 30 reports and memorandums addressing various aspects of the 2000 decennial census. This report describes some of the key “lessons learned” from our reviews. We offer them as guidance for planning Census 2010.

The Bureau is currently conducting its own internal evaluations of 2000 decennial operations. Its findings will be instrumental to the 2010 planning process and, when combined with the guidance we offer here and the analyses of others, should yield a solid framework for designing and implementing a more efficient and effective decennial count.

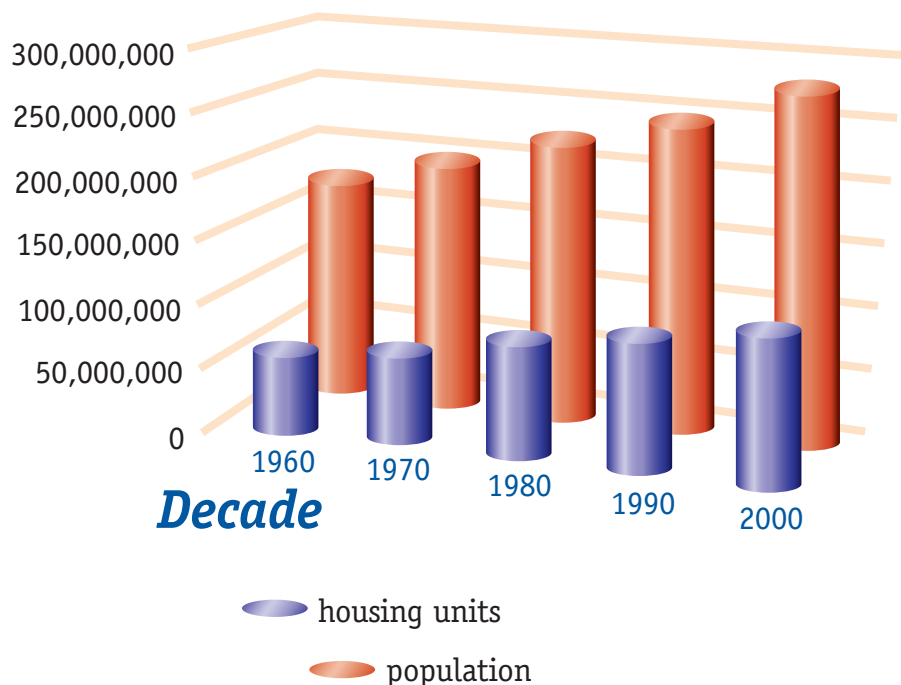
A Critical American Process

The decennial census is a constitutionally mandated population count that provides the basis for reapportioning seats in the U.S. House of Representatives. It is also used for redrawing state legislative district boundaries and allocating federal grant-in-aid funds to state and local governments. Data from decennial censuses provides official, uniform information gathered over decades on the social, demographic, and economic characteristics of the nation’s people. Because of its importance, the decennial census must be as accurate and complete as possible. The Secretary of Commerce is responsible for overseeing all phases of the decennial census and reporting the results of the count to the President by December 31 of the decennial year. The Secretary has delegated responsibility for conducting the census to the Director of the Census Bureau.

The first decennial census was conducted in 1790, and 21 have occurred since then—each one more complex than its predecessor as the number of households increased and the population became more diverse. In just 50 years, the U.S. population has grown by more than 100 million people—from 150 million in 1950 to more than 280 million in 2000. During these same years, the number of housing units increased from 40 million to 117 million. These increases in the population and its diversity have made planning and conducting the decennial census an increasingly time-consuming and complicated process.

The 2000 decennial was surely one of the most challenging of them all.

Growth in Population and Housing Units



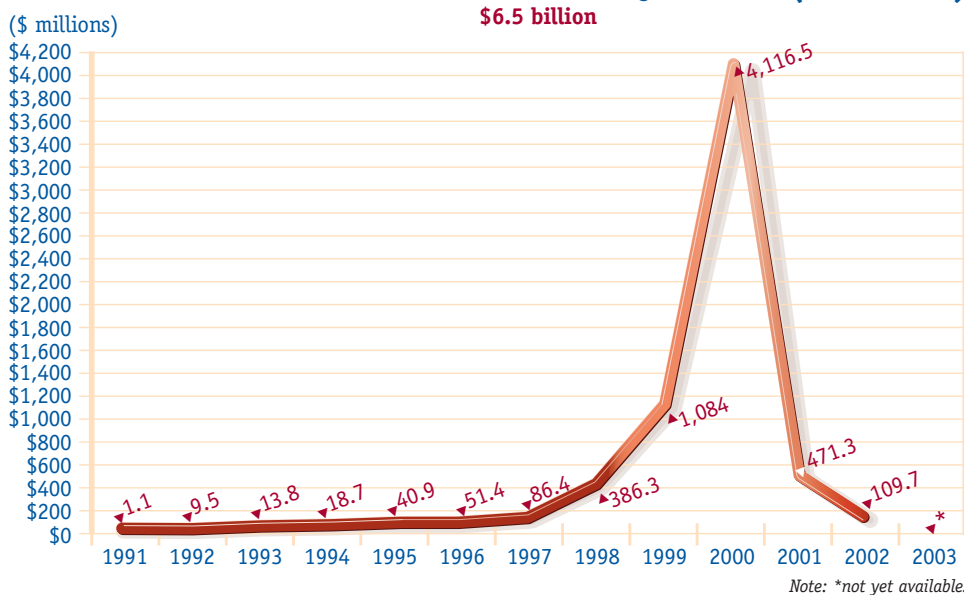
SOURCE: U.S. CENSUS BUREAU

Improving Our Measure of America:
What Census 2000 Can Teach Us in Planning for 2010

Because of political controversy over statistical sampling, the Census Bureau developed two plans for this decennial: one which utilized sampling and the other designed to collect information from 100 percent of the population. The controversy ended in January 1999, when the U.S. Supreme Court ruled that sampling could not be used for congressional apportionment.

Several years before the actual count was to occur, the Bureau began developing an address file and updating its mapping system to pinpoint the location of each housing unit. The Bureau used this Master Address File (MAF) in March 2000 to send out 120 million questionnaires to households throughout the country. Completed questionnaires were returned to one of four data processing sites where census employees scanned responses into a computer. This data was transmitted to the processing center at Bureau headquarters and refined into the "census." The first set of census statistics, released on December 28, 2000, was used for apportionment. Data used for redistricting was released in March 2001. The Bureau also conducted an Accuracy and Coverage Evaluation (A.C.E.) to measure census coverage and potentially adjust census counts.

Census 2000 Total Estimated Full-cycle Cost (1991-2003)



In addition to mailing questionnaires, Census conducted field operations from January¹ through August 2000 to collect information from households and individuals who either did not receive a mailed questionnaire or who failed to return it. To gather and process this information, the Bureau opened a network of temporary field offices: 12 regional census centers for managing field data collection and 520 local census offices (LCOs) for collecting the field data. The Bureau also hired more than 950,000 temporary employees, including local office managers, crew leaders, enumerators, partnership

specialists, and clerks, to operate the offices and collect, tabulate, perform quality control on, and process census information.

Not only is census-taking more complicated than ever before, it is also more costly. In 1960, the government spent \$563 million on the census. By 1990, costs had risen to \$2.6 billion. In 2000, the greater scale and complexity of the census required the use of new technology and the hiring of hundreds of thousands of temporary employees. These factors brought the cost to \$6.5 billion. Early estimates for the 2010 census predict that expenditures will top \$11 billion.

Despite the challenges, Census 2000 is considered a success for having substantially improved coverage over the 1990 decennial. However, cognizant Bureau officials qualify the success:

Rather than being attributable to detailed, integrated testing and planning, Census 2000 successes are largely the result of the huge, late infusion of funds; individual heroics by a limited set of key managers, contractors, and staff; and explicit acceptance of a high risk strategy to develop systems and procedures. ...The Census Bureau believes that to rely on this solution for future censuses, at best, employs an unwise strategy and, at worst, creates a recipe for failure.²

As the Bureau prepares for the next decennial, we wish to share the lessons we learned from our analysis of Census 2000—findings that we believe can help keep costs down and improve outcomes in 2010. We present those findings here, having brought together the perspectives and analyses from many of the census-related activities we conducted prior to and during the 2000 decennial, including the following:

- Preparation of more than 30 decennial-related reports and special memorandums.
- Numerous discussions with Census officials, managers, and staff.
- Reviews of hundreds of questionnaires, quality control forms, and management and financial reports.
- Analyses of the Bureau's address file.
- Visits to numerous census offices throughout the country.

In addition, we considered the work of other oversight bodies including the General Accounting Office (GAO), the Census Monitoring Board, and the National Academy of Sciences (NAS). We attended meetings of the Census Advisory Committee—whose membership included professional associations, data users, state and local governments, and racial and ethnic groups—before, during, and after the census to understand its concerns regarding Census 2000.

We have organized our lessons around 10 major issues that we believe are crucial to the success of future decennial censuses:

1. Reach early consensus on the 2010 design to facilitate effective planning and obtain sufficient funding.
2. Produce accurate, complete address lists and maps.
3. Conduct a carefully targeted and aggressive public awareness campaign.
4. Strengthen quality control of nonresponse follow-up.
5. Implement clear policies and guidance for managing temporary staff.
6. Determine whether sampling has a role beyond measuring coverage.
7. Implement rigorous system and software development processes and effective information security measures.
8. Upgrade and maintain contracting and program management expertise.
9. Generate timely, accurate management and operational information.
10. Mitigate potential disruptions and distractions to the work environment and workforce.

Improving Our
Measure of America:

*What
Census 2000
Can Teach Us in
Planning for
2010*

Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 1: Reach Early Consensus on the 2010 Design to Facilitate Effective Planning and Obtain Sufficient Funding

The Census Bureau must finalize its census design early and secure a steady flow of financial support from Congress and the administration to implement it. The design should be clearly defined; its costs, benefits, and rationale articulated; its risks and issues identified. A solid plan for resolving the risks and implementing the design must be prepared. The problems the Bureau experienced in 2000 are not new. Observations we made about the 1980 census apply equally to Census 2000.

As we reported, there was a lack of realistic scheduling to enable available resources to complete scheduled activities. Plans were not carefully thought out in reasonable time frames, nor were adequate contingencies provided for plans which did not work properly. "Delayed decisions, lack of enforced milestones, late specifications and late procedures were a detriment to the census....[C]ensus planning went staggeringly to the wire." The enumeration started with many programs and procedures not properly tested. A massive amount of resources was devoted toward recovering from malfunctions and to implementing a continuing flow of procedural changes.³

Reach Early Consensus on the 2010 Design

The controversies surrounding the Census 2000 design help explain the added risk and increased expense associated with this decennial and underscore why this experience must not be repeated. However, the situation facing the Bureau can best be understood by looking at what happened in 1990.

For example, the 1990 decennial was expensive and labor intensive because of a lower than expected response. Public cooperation for mailing back the census form was only 65 percent in 1990⁴—down from 78 percent in 1970 and 75 percent in 1980. The low response rate required more intensive follow-up operations than anticipated. The Bureau needed additional appropriations for the extra fieldwork and additional time to complete the count. Despite the extra time and money, accuracy of the 1990 results decreased from that of 1980.⁵

"The design should be clearly defined; its costs, benefits, and rationale articulated; its risks and issues identified."

Particularly alarming to Congress and other stakeholders was the increase in

the differential undercount in 1990—a disproportionate number of the people missed in Census 1990 were minorities. While the national net undercount was 1.6 percent, rates among minorities were as follows: African Americans, 4.4 percent; Hispanics, 5 percent; Asian and Pacific Islanders, 2.3 percent; and American Indians, 12.2 percent.

Congress convened a panel of experts from the National Academy of Sciences to address these problems. The panel concluded that to contain costs and increase accuracy, the Bureau should incorporate statistical sampling and estimation into the 2000 census design. NAS also suggested that the Bureau reengineer the entire census process and its operations. Census agreed with these recommendations and decided to include sampling and estimation, multiple response modes, updated computing tools, and an improved national address file in the design. However, many in Congress did not support the use of sampling for the decennial and believed that by improving traditional enumeration procedures, Census could increase accuracy. Moreover, the NAS recommendations—made in 1994—came too late to allow the Bureau enough time to develop and test the design in 1995, as planned. These factors led to delays in decision making and planning that would impact the entire Census 2000 process.

Continuing Concerns and Setbacks

In March 1995 our office assessed the status of the Census Bureau's preparations for the 2000 decennial.⁶ We found that the Bureau was reengineering the design but did not have sufficient time to test the changes. As a result, it had jeopardized its ability to meet its four goals of restraining cost, increasing accuracy, achieving public acceptance, and meeting national data needs.

With key components of the census design still under development in 1997, Congress rejected the use of statistical sampling in the decennial. In November of that year, Congress passed the Department of Commerce and Related Agencies Appropriations Act for 1998, which among other things provided Census funding for fiscal year 1998 under the condition that the Bureau develop a nonsampling plan and test it at one of the three dress rehearsal sites. A month later, in December 1997, the OIG completed an assessment, requested by the Chairman of the Committee on Commerce, Science and Transportation, of the Bureau's initial design for 2000, which included sampling.⁷ We analyzed key aspects of the strategy and concluded that while each component had its own set of risks, the most significant problems were the design's overall complexity and the limited time frame for implementation. We recommended that the Bureau prioritize the importance of the major components, such as sampling, the Master Address File (MAF), and data capture; assess their readiness for implementation; simplify the design; and reevaluate the cost.

1998 Dress Rehearsal Testing of Still-Fluid Design

The dress rehearsal for Census 2000 was conducted in the spring of 1998 at three locations: Sacramento, California; Columbia, South Carolina; and the Menominee American Indian Reservation in Wisconsin.⁸ These rehearsals were the Bureau's only opportunity for testing the operation and interrelationships of the various decennial components. Given the importance of the dress rehearsal, major elements of the design should have been finalized prior to the rehearsal, but were not. Instead, because of Congress's mandate, the Bureau had to test two designs—one based on sampling (Sacramento) and the other on nonsampling (Columbia). Another key compo-

ment of the design, the Master Address File, was still in development and could not be completely tested, but even the limited testing of the MAF revealed serious problems. For example, the MAF did not include addresses for 24.6 percent of housing units at one site and contained duplicate addresses for 14.8 percent of those at another.⁹

“The need to plan for two census designs is an added complication but our plans for the Dress Rehearsal are fully responsive...The Dress Rehearsal operation will...pursue dual track.”

FORMER ACTING CENSUS BUREAU DIRECTOR

1999 Supreme Court Ruling—A Finalized Design

Uncertainty about whether sampling would have a role in the 2000 census ended in January 1999 when the Supreme Court ruled that statistical sampling could not be used for congressional apportionment. With this

decision, the Bureau moved to finalize the decennial design. In so doing, it found that it needed a huge infusion of funds to support the operations required to accomplish a total population count. Accordingly, in June 1999, Census amended its original \$2.8 billion FY 2000 decennial budget and requested an additional \$1.7 billion from Congress.

Given the difficulties in solidifying the design and the requirement to count 100 percent of the population, the escalation of costs for Census 2000 was inevitable. The Bureau contends that the original FY 2000 decennial budget request reflected its plan to use statistical estimation for gathering data from nonresponding households and for adjusting for undercounting and other coverage errors. With sampling no longer an option, most of the \$1.7 billion was needed to reach the hard-to-count portions of the population—the Bureau estimated that its nonresponse follow-up workload would increase from 30 million housing units to 46 million.¹⁰ The additional funding was also needed to expand advertising and other programs aimed at improving coverage.

Looking Forward to 2010

To its credit, the Census Bureau has already begun planning its design for 2010. It intends to reengineer the address file and associated mapping system and to collect data via the short form and a continuous measurement instrument known as the American Community Survey, and thus eliminate the long form. We commend Census for these early planning efforts. However, we caution that the Bureau can only eliminate the long form if it receives sufficient funding

“We intend for Census 2000...to be the last decennial census to include a long form.”

FORMER CENSUS BUREAU DIRECTOR

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Census 2000
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2010**

for ACS over the decade to preserve the minimum needed sample size; attains adequate response rates and data quality; and keeps the address file and mapping system current and complete enough to support the survey.

The National Academy of Sciences shares our concerns regarding the Bureau's intention to eliminate the long form:

The validity of this assumption appears to depend on the further assumption that the ACS and MAF/TIGER initiatives will be fully funded over the entire decade. The panel believes that it would be prudent to approach 2010 planning with a contingency plan. That is, the

Bureau should consider its possible responses under various funding scenarios (for instance, that the ACS is funded only in the early part of the decade rather than throughout the decade) and have contingency plans for those possibilities.¹¹



We believe that in its planning, the Bureau should seek to maximize the benefits of the ACS for the 2010 decennial, even if the long form cannot be eliminated. To this end, Census should consider whether ACS and decennial long-form staffs could share methods, standards, and resources: Is it possible and practical for them to use the same questionnaire content and layout; sample design; and data collection and processing methods and technologies? Could the sample size for the long form be reduced if the full ACS sample size cannot be attained? To the extent that the ACS and Census 2010 long form share common elements, decennial costs will be minimized and efficiencies achieved. This approach would enable the Bureau to begin acquiring decennial systems early and incrementally, as needs and requirements are understood, and to prepare a contingency plan for using the long form.



Obtain Sufficient Funding

Early and consistent funding for the next decennial is essential to (1) support timely implementation of the design, (2) adequately prepare for mid-decade and dress rehearsal testing, (3) allow for acquisition of major systems, and (4) ensure that a planning team is in place to coordinate and manage the decennial census. In the past, the Bureau has received the bulk of its funding at the end of

the decade, just prior to conducting the census. During fiscal years 1983 and 1984, we reported that the Bureau's planning efforts for 1990 had started late, primarily because funding was not forthcoming. As a result, early planning activities and documentation for that decennial were insufficient, and the Bureau did not have time to fully test and evaluate procedures before conducting the dress rehearsal. During the years most critical to the planning effort—1990 through the dress rehearsal in 1998—the Bureau received only about 3 percent of the total life-cycle appropriation.¹² We believe that a higher percentage of life-cycle costs should be requested during the planning years to avert last minute budget requests and high-risk approaches.

Looking ahead, senior Census Bureau officials have emphasized the need to better align the planning and funding cycles. Although Congress may find it difficult to change the basic pattern for decennial funding, past decennials illustrate that failure to provide adequate funding throughout the decade will diminish the Bureau's ability to control costs and ensure the accuracy of Census results.



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"If the address list is incomplete or inaccurate, people may be missed. If it includes duplicate addresses, they will be counted more than once. Such errors increase costs by requiring follow-up to nonexistent or duplicate locations."

Lessons Learned

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Planning for
2010*

Lesson 2: Produce Accurate, Complete Address Lists and Maps

The success of a census ultimately depends on the accuracy of address information used to contact respondents. If the address list is incomplete or inaccurate, people may be missed. If it includes duplicate addresses, they may be counted more than once. Such errors increase costs by requiring follow-up to nonexistent or duplicate locations. To locate households during the 2000 decennial, the Bureau created a database called the Master Address File and linked each address in the MAF to its geographic location in a mapping system known as TIGER (Topologically Integrated Geographic Encoding and Referencing). This process allowed Census to identify the specific location of each housing unit, to create maps, and to facilitate redistricting once the survey results were tabulated. Using the MAF, the Bureau mailed census forms to more than 100 million households across the country.

We found that Census did not establish procedures that would adequately ensure the MAF's accuracy and completeness, and thus used an error-prone database to conduct the decennial.¹³ Numerous addresses did not link to the correct location in the TIGER file, which hampered the Bureau's ability to accurately determine a housing unit's location. Some errors in the file occurred because address verification plans were flawed. For example, the Bureau did not have time to verify the accuracy of millions of addresses sent in by local governments but nevertheless included these unverified addresses in the MAF. In addition, Census modified its software for eliminating duplicate addresses in an effort to improve its coverage of multiunit housing such as trailer parks and apartment buildings. However, the change allowed many suspected duplicate addresses to remain in the address file. Our analysis of a small sample of MAF addresses for one county indicated a high number of errors. We found duplicate addresses, as well as addresses for nonexistent houses and uninhabited apartment complexes. Maps often contained duplicate and missing streets, and were not always printed in a usable size and format.

Concerned about the quality of the MAF, the Bureau reviewed census results to identify duplicate enumerations. It isolated more than 2 million addresses (which accounted for some 6 million people) as possible duplicates and removed them from the decennial file while it sought to verify whether these enumerations were in fact double-counts. Subsequently, the Bureau determined that 2.4 million of the suspected duplicates were valid and added them back into the census totals. This process of identifying and removing duplicates from the census totals was necessary, but required the Bureau to develop and implement last-minute procedures on the fly. These extra steps added risk to the census process. Similar situations must be avoided in 2010.

The Master Address File is crucial to the success of the decennial, and Census plans to spend hundreds of millions of dollars to improve it and the associated mapping system for 2010. The Bureau is attempting to take advantage of current and emerging technologies for managing these tools. We agree that improvements are essential and urge the Bureau to establish performance measures for MAF accuracy and completeness, to periodically test the address file against these goals, and to report to decision-makers on the status of the improvement efforts. These steps, taken throughout the decade, should help ensure that the MAF is fully reliable for Census 2010.

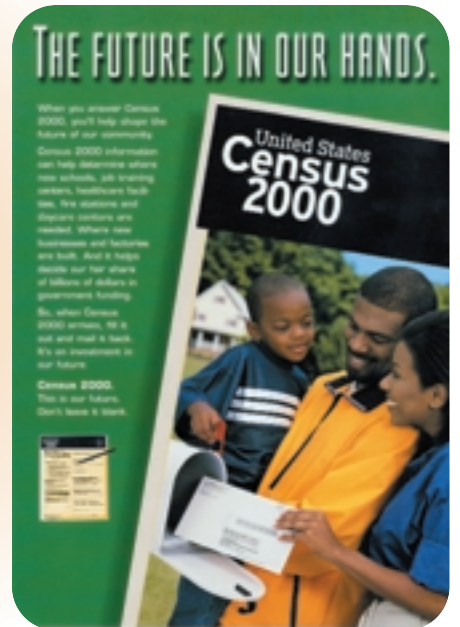
Improving Our Measure of America:

What Census 2000 Can Teach Us in Planning for 2010



"The ad campaign helped the Census Bureau reach into communities with a strong message of community pride and civic participation."

CENSUS BUREAU



Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 3: Conduct a Carefully Targeted and Aggressive Public Awareness Campaign

Generating a high return rate for mailed questionnaires is critical to keeping census costs down while maximizing coverage and accuracy: the higher the mail-back rate, the fewer the households that will require nonresponse follow-up and the lower the total cost of the census. In addition to cost considerations, questionnaires returned by mail tend to contain more complete information than do forms completed by enumerators.

The Census Bureau had projected that the response rate for mailed forms in 2000 would be lower than that in 1990. Hoping to improve this projection, the Bureau developed a two-pronged public relations program that combined a national paid advertising campaign—the first-ever to be conducted by Census—with a local government partnership initiative.¹⁴

The impressive advertising campaign blanketed the country with more than 250 ads in 17 languages in an effort to reach every household, including those in historically undercounted populations; alert residents to the impending arrival of census forms; and convey the importance of mailing the survey back. The partnership project created more than 140,000 alliances between the Bureau and state and local governments to develop community-level programs to educate individuals about the census and encourage them to complete and return the questionnaire.

Census 2000's paid advertising and partnership campaign achieved its intended goal—the response rate of 67 percent surpassed the 1990 response rate of 65 percent, despite projections of lower participation. The campaigns should be repeated for 2010, and perhaps expanded to reach greater numbers of people from hard-to-count populations.

However, ineffective components of the publicity effort should be eliminated or redesigned. The Be Counted program, for example, sought to improve coverage in hard-to-enumerate areas by making forms available at public places such as health clinics, employment assistance centers, and churches. The program failed to substantially improve response rates. According to the Bureau, Be Counted's impact on net coverage during the decennial for any group was minimal.¹⁵

We believe that the Bureau must reevaluate whether the Be Counted program can be a cost-effective tool. In addition, it must find other ways to increase response rates among hard-to-count populations and, through research and testing, demonstrate that proposed programs can achieve the desired goals.

*“What’s in it for me?”
became the strategy and
core of the paid advertising
campaign. And from this
was born the campaign’s
tag line: “Census 2000.
This is your future.
Don’t leave it blank.”*

Improving Our
Measure of America:

*What
Census 2000
Can Teach Us in
Planning for
2010*

The Miami Herald

Census to recount
70,000 homes in Hialeah

July 17, 2000

"[Nonresponse follow-up in Hialeah] had been disorganized from day one and worsened because top managers approached the national census like it was the Daytona 500, cutting corners in a race to take the checkered flag of head counting... They wanted to finish first" said an assistant crew leader. "But you know what? The first ended being the worst."

MIAMI HERALD 7-20-00.

Sun-Sentinel

August 7, 2000

Probe widens into allegations that
Census data in S. Broward
was falsified

Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 4: Strengthen Quality Control of Nonresponse Follow-up

The quality of census data came under attack during Census 2000. Negative newspaper headlines drew national attention to problems with collection operations in several areas. Accusations of wrongdoing at times were well founded. Several local offices reported problems with data quality, and we were able to confirm such problems at three Florida locations—Hialeah, Homestead, and South Broward.¹⁶ Because of these findings, the Bureau had to reenumerate more than 67,000 households. Census also experienced quality control problems in 1990. In that instance, because enumerators did not collect complete household information, the Bureau had to survey 129,000 households a second time.

To control the quality of data collected by enumerators in Census 2000, the Bureau implemented a reinterview operation to identify census-takers who falsified data or needed additional training in proper collection techniques. Under this process, a sample of each enumerator's work was to be verified via telephone call or personal visit by a second interviewer ("the reinterviewer"). If it was determined that information had been falsified, the reinterviewer would notify the office manager, who was supposed to fire the employee and redo all of the employee's work. However, we found that this process did not always function as intended. The improvements detailed below should help ensure the quality of data collected in future decennials.



- **Continue to select a sample of questionnaires for reinterview throughout nonresponse follow-up.** For Census 2000, the Bureau selected questionnaires for reinterview primarily at the beginning of nonresponse follow-up, leaving itself vulnerable to falsifications and mistakes that occurred later in the operation—when the pressure to complete questionnaires was greater.
- **Improve local offices' handling of reinterview forms to ensure that selected questionnaires are verified.** Data from hundreds of questionnaires selected for reinterview examination was never verified either because the questionnaires were sent to the data capture centers before the information had been transcribed onto a reinterview form or because the reinterview questionnaire itself was lost in the field. At one local office, we found stacks of summary reinterview sheets that the supervisor did not review and sign until the last day of nonresponse follow-up—far too late in the process to identify falsifiers and redo their work.

Improving Our
Measure of America:

**What
Census 2000
Can Teach Us in
Planning for
2010**

- **Separate the reinterview process from the field operation it is evaluating.** During Census 2000, we noted that the same manager oversaw both collection and verification of information. Given the pressure to complete fieldwork within a tight time frame, there exists the temptation to keep additional work to a minimum. Ignoring possible instances of data falsification would lessen the LCO's workload. To avoid this temptation and to ensure that there is a separation of duties, which would minimize this conflict, local offices should have one manager for overseeing information collection and another for overseeing verification.
- **Develop a management reporting process for quality assurance.** Census did not have a real-time management reporting system for the reinterview operation, and therefore could not readily assess the effectiveness of the program.



Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 5: Implement Clear Policies and Guidance for Managing Temporary Staff

Imagine the logistics of opening and managing 520 temporary local offices, of hiring nearly 1 million employees and overseeing the extensive field operations they performed—promotion, outreach, group quarters enumeration, and nonresponse follow-up, to name a few. These were the challenges facing the Bureau for Census 2000.

Field operations are the backbone of the decennial and are thus critical to its outcome. The Bureau's experience with the temporary office and staffing operations during this past decennial provides insight for improvements in 2010.

Encouraging an Open Dialogue Between Field Staff and Headquarters

Permanent and temporary employees staff the 12 regional census centers, which provide a crucial communications link between headquarters in Suitland, Maryland, and the local offices. Regional staff we spoke with indicated that communication between the regions and headquarters had improved during the last decennial, as compared to previous decennials. They attribute this improvement, in part, to the Bureau's selection of a well-respected Regional Director to temporarily fill in as the Acting Census Director in 1998 and to Headquarters managers who involved the regions more in the planning and development of the 2000 census. We commend the Bureau for having fostered this improved relationship between the field and headquarters. It must do all it can to keep the lines of communication open as planning for 2010 continues.



Enhancing Security and Safety Procedures

In the aftermath of the April 1995 Oklahoma bombing and the September 11 terrorist attacks, government agencies across the board are evaluating safety and security measures against more rigorous standards and overhauling procedures to meet them. Although we did not formally review safety and security for Census 2000, we observed that the Bureau did require enumerators to take precautions, such as notifying the police and working in pairs or groups when enumerating areas considered unsafe. These measures may have been adequate for Census 2000. But given the post-September 11 demands for improved security, the Bureau should reassess its safety and security practices for the 2010 census.

Improving Management of Temporary Employees

Managing 950,000 temporary workers is a huge and difficult task. The experience of Census 2000 pointed up some specific challenges that the Bureau must address for the 2010 decennial in order to enhance staffing operations.

- ***Develop clear policies for reimbursing overtime.*** Policies, procedures, and practices for overtime pay generated numerous complaints during and after Census 2000, and the Bureau must reassess and refine these policies for 2010. Keeping overtime costs down is an important budgetary control. Census must do a better job of establishing workflow procedures that enable employees to accomplish their tasks, but allow for overtime when warranted.
- ***Carefully document performance problems and terminate unsatisfactory employees.*** During the 1990 decennial we found that census managers often did a poor job of documenting performance problems and as a result had to pay questionable unemployment claims. Learning from 1990, the Bureau had a strict policy for documenting performance problems during the 2000 decennial¹⁷ and, as a result, successfully refuted 92 percent of 4,747 questionable unemployment compensation claims. The Bureau must maintain this policy for 2010, and continue to stress to local office managers and staff the importance of identifying poor performers, completing termination forms, and entering all documentation into an employee's termination file. These procedures will enable Census to deny unemployment compensation to employees terminated for cause and prevent reassignment of unsatisfactory workers to other local offices.

Census appeared to have adequate termination procedures. However, local managers did not always terminate unsatisfactory employees but, instead would refrain from assigning them new work. Some managers were reluctant to terminate out of concern that the separated employee would be unable to find another job. Others were put off by the amount of time and paperwork involved in terminating workers and justifying the action. By failing to properly identify and terminate unsatisfactory employees, managers enabled poor performers to qualify for unemployment benefits and reassignment to other LCOs.

- ***Establish traceable procedures for transferring enumerators.*** Census routinely sent enumerators from local offices that were meeting or exceeding nonresponse follow-up schedules to those that lagged behind. This policy seemed to be an effective way to improve production, but it complicated management attempts to monitor an enumerator's work. Some reassigned enumerators submitted their daily payroll sheets to their original office but gave the questionnaires completed during that work time to the office to which they were reassigned. In these cases, neither office was able to assess the enumerators' productivity against their hours worked. In addition, managers had no written guidance on whether to reassign individual enumerators or entire teams (enumerators, crew leaders, and field office supervisors).

Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 6: Determine Whether Sampling Has a Role Beyond Measuring Coverage

The issue of whether to use statistical sampling to improve coverage was perhaps the most controversial aspect of Census 2000. Not only did the Supreme Court rule that sampling could not be used for apportionment, but the Bureau's recent analysis has been unable to prove that sampling will improve coverage. Sampling was also an issue in 1990, when the Secretary of Commerce decided not to release adjusted census counts because of data concerns. Given this history, we believe that the Bureau must determine, at the earliest possible time, the following for 2010: Does sampling have any purpose other than being a quality check to measure coverage? This decision is important for decennial planners because the role of sampling impacts both the cost and schedule for conducting a decennial census.

Census had planned to use sampling in 2000 to correct some of the deficiencies identified in earlier decennials—namely, the drop in coverage and the escalation in cost that occurred between 1970 and 1990. After the Supreme Court ruled in January 1999 that sampling could not be used for congressional apportionment, the Bureau continued to plan the Accuracy and Coverage Evaluation, believing that in addition to measuring coverage, sampling could yield more accurate data for other public purposes, such as redistricting and the allocation of federal funds.¹⁸

In the 2000 decennial, A.C.E. was conducted as an independent sample of 315,000 housing units located throughout the 50 states, the District of Columbia, and Puerto Rico. The Bureau interviewed unit residents either by phone or in person to determine whether they should have been counted at the sample address on Census Day and whether those counted on that day had since moved. The A.C.E. data was then matched to corresponding census data collected for each housing unit. Once matched and reconciled, A.C.E. data yielded an estimate of the population missed in the census, while the corresponding census sample yielded an estimate of the number of people correctly enumerated. Taken together, these two components provide an estimate of census coverage, or “adjusted census counts.”¹⁹

The Bureau initially thought that A.C.E. estimates would give states more accurate data for redistricting. However, because of inconsistencies between demographic benchmarks and A.C.E. estimates of the population count, Census was unable to conclude whether the adjusted data was more accurate than the unadjusted data.²⁰ Therefore, in March 2001, unadjusted counts were released to the states for use in redistricting, but the Bureau continued to evaluate A.C.E. In October 2001, it reported that A.C.E. had a significant number of erroneous census enumerations, many of which were duplicate persons, and as a result, unadjusted census counts remained more accurate than the adjusted data.²¹ Nevertheless, the Bureau has not given up on A.C.E. and believes that with further research and analysis, the data that has been collected can be revised to provide accurate estimates for use by other federal agencies.

Improving Our
Measure of America:

**What
Census 2000
Can Teach Us in
Planning for
2010**

The Bureau had a similar experience trying to adjust census counts in 1990 using the Post Enumeration Survey (PES). In that case, the Secretary of Commerce decided against using adjusted data because it did not meet specified adjustment criteria.²²



Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 7: Implement Rigorous System and Software Development Processes and Effective Information Security Measures

“The Bureau needs to mount a comprehensive analytic approach that includes a rigorous systematic development methodology. . . .” Senior Census Bureau Official

Information technology and related processes are among the most critical components of modern-day decennials. Adhering to rigorous system and software development standards and maintaining information security are key to the census’ success and cost-effectiveness.

Planning for the IT needs of 2010 and maintaining secure information systems, networks, and data are important steps in the continuum of decennial operations. The Bureau must capitalize on the experience of staff involved in Census 2000 while memories of the challenges are fresh. These experiences offer invaluable guidance for understanding 2010 IT requirements. The Bureau also needs a strict, cohesive process for system and software development that is supported by Census leadership, planning, and training.

“An operation as huge and complex as the decennial census requires long lead times to allow for proper development and testing of the project design and software, and to procure systems.”

Development of information systems and software must conform to rigorous processes and accepted standards. Census 2000 required computer systems that enabled the Bureau to locate 117 million housing units and collect and process responses for 281 million persons. The Bureau relied on these systems to do the following:

- Conduct field operations using a current address file and map data, and make additions, changes, and deletions to this information as necessary.
- Create a database that used addresses and locations of residences to track such items as responding versus nonresponding households and incomplete responses.
- Provide payroll services and management information to 520 local census offices.
- Capture response data via a contractor-developed system installed at three contractor-managed centers and at the Bureau’s National Processing Center in Jeffersonville, Indiana.
- Process data at headquarters, where response information for each housing unit was checked

Improving Our
Measure of America:

**What
Census 2000
Can Teach Us in
Planning for
2010**

for multiple responses and then merged with housing unit location data to produce the consolidated census data file.

- Tally state counts for apportionment and tabulate counts from smaller geographic areas and demographic subgroups for redistricting.

The technology that supports these initiatives must be built on a thorough analysis and definition of user requirements and a defined and controlled development process.

“...it is important that we give a high priority to IT security.”

SECRETARY OF COMMERCE

Without exception, our IT-related reports issued through the decade have repeatedly recommended that the Bureau restructure its software development efforts to employ a rigorous process and accepted engineering standards. We reported that the Bureau’s development approach was not based on well-established standards for preparing and reviewing software specifications and design; conducting

rigorous, independent testing; and ensuring the uniform and effective use of development and evaluation methods and tools. We also reported concerns about whether the processing power of the Bureau’s computer systems was sufficient to support Census 2000 operations.^{23, 24, 25} As the census progressed, system and software development and testing efforts faltered. GAO reported that, as late as 3 months after the census questionnaires were mailed out, 17 of 48 software applications needed to process Census 2000 response data were still under development.²⁶ Moreover, the Bureau did not perform beginning-to-end, exhaustive stress testing of the computer applications that processed decennial responses.

In the absence of rigorous development standards, software products are often ambiguously defined, completed behind schedule, and subject to late-stage changes and cost increases. Products whose requirements are not clearly specified cannot be adequately tested because there are no exact criteria to measure against. These improperly evaluated products are then put to use in real situations, where their weaknesses disrupt operations and spawn a rushed, *ad hoc* approach to correcting the problems as quickly as possible. In this environment, new errors inevitably replace the old.

We found that because new and modified software developed for Census 2000 was not subject to sufficient control or adequate testing, it was prone to error.



For example, faulty software caused the Bureau to supply enumerators with address listings that had missing last names for some residents. This problem made it difficult for enumerators to locate some nonrespondents during follow-up operations.

Census analysts described the impact of the late and changing software development process as follows:

“Developing production software concurrent with production activities introduces increased risk that cannot easily be compensated through additional resources, and in such an environment the burden falls on the few very experienced professionals to make on-the-spot decisions and corrections.”²⁷

The Census Bureau is seeking funds to address these problems for the 2010 decennial.

Providing effective information security is essential for the 2010 census. Under Title 13 of the U.S. Code, the Census Bureau must protect from disclosure the data it collects about individuals and establishments. Disclosing such information could undermine the success of future decennials by damaging public confidence in the Bureau’s ability to protect the confidentiality of census data, thus compromising the willingness of individuals to participate in the census. We evaluated the security measures used by the Bureau to transmit Title 13 data over its dedicated circuits (wide area network) and dial-up lines.²⁸ We had major concerns about the adequacy of these measures and made recommendations to reduce the risk of disclosure. Given the inevitable increase in Internet use and the Bureau’s own growing emphasis on electronic transmission of questionnaire data, effective information security for Census 2010 is essential. The Bureau must adhere to rigorous information security policies and procedures and be attuned to new threats and vulnerabilities. It must incorporate emerging technologies, as appropriate, that will safeguard census-related computer systems and networks from unauthorized access, and data from unauthorized disclosure or modification.

Improving Our
Measure of America:

***What
Census 2000
Can Teach Us in
Planning for
2010***

Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 8: Upgrade and Maintain Contracting and Program Management Expertise

Experienced program managers supported by a well-trained management and contracting staff must be in place before the Bureau enters into major contracts for decennial-related systems and services. Over the years, our reports questioned the Bureau's ability to acquire the critical systems and services needed to successfully complete the 2000 decennial, such as the data capture system, telephone questionnaire assistance, and leased space for hundreds of field offices. Ultimately, these projects successfully supported Census 2000 operations but were more costly than necessary.

The Bureau's initial effort to plan and manage acquisition of the data capture system is a case in point. This system was critical to the decennial—responsible for scanning more than 100 million questionnaires, correctly capturing and reading the data, and sending the information to headquarters for additional processing. In a September 1994 report we noted that the Bureau had yet

“As the Department of Commerce increases its reliance on contractor-provided goods and services, the challenge of monitoring the effectiveness of the acquisition process grows as well.”

**IG'S LIST OF TOP 10 MANAGEMENT
CHALLENGES FACING THE
DEPARTMENT OF COMMERCE**

to appoint a program manager for the procurement or to develop an acquisition plan.²⁹

In 1996 we again looked at the Bureau's progress toward acquiring the data capture system.³⁰ Contract award had been scheduled for the fall of 1996 but had been delayed until early 1997. In addition to the inherent risk in the delay, we felt that the Bureau's strategy for bringing the system on board was problematic: Census intended to select two contractors to design

and test prototype systems and on the basis of their performance, select the final contractor. However, we believed that the primary goals of the data capture program—namely, achieving the needed system capabilities and meeting the Census 2000 schedule—could best be achieved by working closely with one competent contractor from the start.

We reported that the Bureau's strategy of working with two contractors would extend the already-delayed schedule, consume additional budget and staff resources, and severely limit Census management's ability to communicate with the contractors for fear of inappropriately transferring technical information from one to the other. We recommended that the Bureau award one contract, develop a sound plan for procuring and managing the system, and establish a program management office staffed with personnel who had demonstrated experience in managing complex systems acquisitions. We also recommended that the Bureau supplement its planned heavy

reliance on oral proposals and past performance with additional technical information on how the offerors would satisfy the unique and complex requirements of the data capture system. The Bureau implemented our recommendations and also established the Decennial Systems and Contract Management Office to supervise other Census 2000 systems and contracts. It appointed a qualified program manager and contracting officer to oversee acquisition and administration of the data capture system.

"The Bureau did not have experience managing multi-million dollar service and supply contracts. Its on-board contracting staff had little experience with major systems acquisitions, and this lack of experience was a problem."

Despite these actions, a shortage of experienced contract staff continued to be a problem. Vacancy announcements posted in April 1997 yielded little response, reportedly because federal hiring constraints prevented Census from offering permanent positions and matching private industry salaries.

Although the data capture system succeeded in meeting its processing deadlines and producing high-quality results, costs for the system increased almost fivefold, from a projected \$49 million at the time of contract award in 1997, to \$238 million. It was recognized in 1997 that additional system needs remained to be defined and that costs would

increase. However, the degree of increase far exceeded the Bureau's expectations, primarily because of ever-changing and expanding requirements. Despite efforts by the program office to stem the increase, demands came from other areas as decennial plans changed and new needs were identified. More disciplined management of needs identification, supported by senior Bureau staff, would have enabled the office to better control the requirements and the associated costs.

We reported in our evaluation of the data capture system's performance for dress rehearsal that the system's contractor had planned to use rigorous and well-defined engineering procedures, but abandoned these plans because of the continuing growth and change in Bureau requirements. Instead, the contractor developed, tested, and deployed software and system components concurrently and on a short cycle that did not allow enough time to consistently apply sound engineering practices, including methodical testing. As a result, many problems that should have been identified before the dress rehearsal were found as it occurred.³¹

The lack of sufficient contracting and program management expertise impacted numerous other contract operations, as the following examples illustrate:

- **Telephone questionnaire assistance.** The Bureau contracted with a company to provide toll-free telephone numbers that allowed the public to ask questions and complete the survey over the phone. We found that the Bureau had not prepared a contract surveillance and management plan because its program office had insufficient staffing and limited experience

with large-scale contracts. These plans are important—they describe the responsibilities, roles, and interactions among the program office, contracting officer, and contractor, and thus help ensure that the contract is executed successfully and is not changed without authorization, and that the contractor performs as expected.³²

- **Advertising campaign.** The Bureau essentially assigned one contracting officer to award and manage the contract for its extensive publicity campaign. The officer was responsible for numerous tasks such as defining and clarifying requirements, monitoring costs, reviewing invoices, and negotiating task orders and contract changes. While the campaign was considered a major operational success, the cost—which was originally estimated at \$100 million—had almost doubled, to about \$200 million, by the close of the decennial.
- **Leasing of office space for field operations.** Census sought assistance from the U.S. General Services Administration (GSA) to procure space, telecommunications, supplies, and some office equipment, but shortsighted planning and management hindered these efforts, and the partnership with GSA ran into several problems.³³ First, failure of the parties to sign a memorandum of understanding left open the possibility of misunderstandings and disagreements about costs. While such problems did not materialize in 2000, a signed memorandum of understanding should be in place for 2010 to protect the Census Bureau's interests. Second, Bureau delays in finalizing its requirements, in particular its telecommunications needs, delayed the opening and operation of some local offices. Third, because the Bureau defined the geographic locations for its LCOs too narrowly, it limited competition for its business. Consequently, during the first phase of office leasing, the lease offers it did receive were more expensive than anticipated, and the Bureau lost valuable time seeking more affordable space. Subsequently, for phases 2 and 3, the Bureau broadened the geographic location for the leasing of LCOs. This change increased competition and gave the Bureau more options for locating LCOs.
- **Error in prenotification letter.** The Bureau used the Government Printing Office to contract for the printing of decennial census questionnaires. GPO, in turn, selected a variety of companies to provide these services. One of these contractors printed and mailed out approximately 20 million misaddressed letters informing households that the decennial questionnaires would soon follow. The mistake—an extra digit at the beginning of each street address—was the result of a problem with the contractor's printing program. Despite the error, the Postal Service was able to deliver the letters, but the Bureau still incurred unnecessary negative publicity just weeks before census forms were to be mailed out. Bureau officials told us that quality assurance procedures for census operations did not cover the printing of addresses on envelopes. For 2010, the Bureau needs to ensure that the quality and accuracy of all census materials, including envelopes, are carefully monitored.

Experiences such as these underscore the importance of contracting and program management expertise to the success of the 2010 decennial. The Bureau reports that it is taking steps to maintain the organization and critical staff needed to manage Census 2010 contracts.

Improving Our
Measure of America:

***What
Census 2000
Can Teach Us in
Planning for
2010***



Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 9: Generate Timely, Accurate Management and Operational Information

The decennial census is one of the most comprehensive and important information-gathering activities conducted by the federal government: the data it collects has wide-ranging impact on governing institutions and local communities. The effectiveness of the Bureau's management information system impacts the effectiveness of the decennial process and the integrity of data. This system must provide timely and accurate administrative and operational details to the Bureau personnel who manage the decennial census, as well as information to those who monitor it—Congress and oversight groups (GAO, the Census Monitoring Board, and the OIG). Only with such information can these individuals and organizations evaluate census performance, make informed decisions about operational changes that may be needed as the census progresses, and help improve future decennials. Because of weaknesses in the management information system

...the Bureau must ensure that resources are specifically provided for adequately communicating and coordinating with the numerous oversight bodies.

that supported the 2000 census, Bureau managers did not always have the decision-making information they needed.

Oversight groups had great difficulty obtaining timely information on the status and effectiveness of decennial operations, with many weeks passing between their request for information and receipt of it. As a

result, oversight bodies frequently complained of being kept in the dark about operational progress and financial resources expended; Bureau managers complained about disruptions caused by the information requests. Given the importance of the census and the amount of taxpayer dollars required to conduct it, the Bureau needs to be prepared to handle huge demands for information, both internally and externally. For the 2010 decennial census, the Bureau must ensure that resources are specifically provided for adequately communicating and coordinating with the numerous oversight bodies, and establish and maintain management systems that fully disclose real-time, reliable, and accurate financial and operational information.

The inability to provide timely and accurate information during Census 2000 proved particularly troublesome in three areas—proxy questionnaire data analysis, productivity reporting, and hours worked by enumerators.

Proxy questionnaires. When enumerators are unable to survey the occupant of a unit, they gather “proxy” information from knowledgeable neighbors. Too many proxy questionnaires are an indication that enumerators are having problems collecting data—a situation that requires immediate attention.

During Census 2000, the Bureau failed to track and analyze proxy questionnaire data—thus depriving itself of a critical management tool for assessing the integrity of nonresponse follow-up operations. Had the Bureau monitored proxy data, it would have recognized enumeration irregularities in Hialeah, Florida, where the local census office sanctioned inappropriate use of proxy questionnaires and abused other procedures. As a result of these actions, Census had to completely reenumerate the Hialeah district.

The number of LCOs that allowed similar improprieties will never be known because data from proxy questionnaires was unavailable during the nonresponse follow-up operation. In 2010, the Bureau must closely monitor this data collection category to avoid repetition of these abuses.

Productivity. Data reflecting enumerator productivity was flawed by the failure of some enumerators to properly code completed questionnaires for data entry. Enumerators were required to complete the interview summary section of the questionnaire, which provided the status of the housing unit (vacant or occupied), the number of residents, and the willingness of occupants to provide information. Local offices used these summaries to generate productivity reports. Bureau managers used the reports to monitor and oversee nonresponse follow-up operations—comparing data among local census offices that had similar characteristics, identifying irregularities, and measuring the quality of data collected. Reports that showed a large number of partial interviews or refusals gave warning that enumerators might be improperly trained or falsifying data.

In several LCOs, enumerators incorrectly designated their interviews as “COs” (“closeout procedures”), thinking the code (which is not defined on the form) meant that an interview had been “completed.” In fact, during closeout procedures, only unit status and population counts for households are collected, and these procedures may not be used until 95 percent of an LCO district has been enumerated. Because some interviewers mistakenly coded their forms as COs throughout nonresponse follow-up, the data from these questionnaires was not useful.

This problem could easily be rectified for 2010 by revising the questionnaire status section of the form to include definitions of each code. At present, enumerators who are unsure of a code’s meaning and use must consult the enumerator training manual to find an explanation. During Census 2000, many obviously failed to take this step. Ready access to the needed information right on the form would greatly reduce the chance for error.

LCO staff hours. Some local census offices miscoded the time worked by assistant crew leaders as time worked by enumerators during nonresponse follow-up. This mistake inflated tallies for time worked and compensation received by enumerators—adding some 3.6 million hours and at least \$29.7 million in wages (based on the lowest hourly pay of \$8.25)—and thus compromised the value of the data for assessing staff-related expenditures versus output.³⁴ For 2010, the time entered into the payroll system for crew leader assistants and enumerators needs to be accurate.

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*



Lessons Learned

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

Lesson 10: Mitigate Potential Disruptions and Distractions to the Work Environment and Workforce

Each decennial brings new challenges—some foreseen, others unexpected—that the Bureau must be prepared to handle. By learning from prior censuses, the Bureau has positioned itself through the decades to anticipate and diffuse potential problems that may emerge during the decennial process. Demographic and technological changes have required major strategy modifications. For example, for the 1970 decennial, Census determined that it could not effectively enumerate the population through personal visits alone. It reengineered the 1970 design, moving to self-response mailings as the primary mode of data collection—a strategy still in place today.

The Bureau is already aware of two challenges it must prepare for in planning and executing the 2010 decennial: a looming skills drain from its census management pool and a major relocation. Strategies for meeting these challenges should be in development now.

Over the coming decade, the Bureau could lose to retirement roughly 50 percent of the senior staff who oversaw the 2000 count. Census is fortunate to have a dedicated core group of career managers and senior staff whose mission-critical expertise has been built over decades of developing, refining, and conducting successive decennials.

The impending retirement of many of these key employees—field supervisors, technical managers for data processing, senior statisticians, and other census leaders—has the potential to decimate the ranks of decennial experts from all operational areas. Specifically, the Bureau faces losing institutional knowledge, which will increase work backlogs and create skill imbalances. All of these impacts can affect its ability to plan and conduct the 2010 census. To minimize the impact of these problems, the Bureau must meet them head-on by developing a comprehensive workforce plan now that will identify critical needs for 2010 and offer realistic solutions to meeting them.

Also during this decade, Census will move to its new headquarters facility, which is scheduled for occupancy in 2008. The Bureau must be prepared to accomplish this move with minimal disruptions to decennial planning. Its relocation strategy must clearly define and diffuse potential problems; identify measures to contain costs; and offer fail-safe methods for keeping decennial preparations on schedule.

Conclusion

The decennial census is a barometer of change in America—it measures our changing numbers, our changing ethnic/racial composition, and our changing choices about where to live. It measures how old we have become, how much we earn, how educated we are. It gauges whether we are single or married, have children, are native-born or came from abroad. It calculates how many other Americans at a particular point in time share these and other characteristics with us. Ultimately, it impacts how we are represented in government and how our tax dollars are spent.

For the past 22 decades, the Census Bureau has by and large captured these changes successfully via the decennial process, and—with careful attention to the lessons learned from this decennial—it will no doubt succeed in doing so again in 2010. The Bureau is already taking steps on a number of fronts: It is developing a census design and revamping the Master Address File. It has evaluated and begun enhancing its public outreach campaign. It continues to assess and refine the role of sampling. It is working to maintain the critical management skills it needs to oversee census contracts. And it is seeking funds to improve its IT development processes.

As has been our practice for past censuses, the Office of Inspector General will monitor and evaluate the Bureau's efforts to improve decennial operations and prepare for the next census, and we will offer guidance to support and enhance its readiness.

In the final analysis, many of the “lessons learned” we have discussed in these pages have relevance beyond the upcoming decennial, and are likely to remain key components of sound planning for decades to come. The extent to which the Census Bureau applies them to emerging conditions and evolving trends will help determine how effectively it accomplishes the major mission with which it has been charged—developing a composite picture of America via the decennial census.

Notes

Improving Our
Measure of America:
*What
Census 2000
Can Teach Us in
Planning for
2010*

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Improving Our
Measure of America:

*What
Census 2000
Can Teach Us in
Planning for
2010*

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