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## 2020 CENSUS

# Recommended Actions Need to Be Implemented before Potential Cost Savings Can be Realized

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# GAO Highlights

Highlights of [GAO-15-546T](#), a testimony before the Committee on Homeland Security and Governmental Affairs, U.S. Senate

## Why GAO Did This Study

The cost of the decennial census has steadily increased each decade, with the 2010 Census being the most costly in history, totaling approximately \$13 billion. If the growth rate continues, the 2020 Census could cost approximately \$25 billion (in constant 2010 dollars). In an effort to contain costs while continuing to ensure an accurate enumeration, the Bureau is researching and testing new methods and technologies.

This September, the Bureau plans to announce its preliminary design for the 2020 Census, and in October 2018 the Bureau plans to have all systems and processes for the 2020 Census developed and ready for operational testing. As Census Day 2020 gets closer, the margin for schedule slippages is becoming increasingly narrow.

GAO was asked to testify on the Bureau's progress in implementing cost-savings initiatives and associated challenges for the 2020 Census. To prepare this statement, GAO relied on its previously published work in this area over the last several years.

## What GAO Recommends

In its prior work, GAO made 121 recommendations to, among other things, assist the Bureau in planning for its Internet response option, completing key research and testing activities, and improving its IT management and security. The Bureau generally agreed with these recommendations.

View [GAO-15-546T](#). For more information, contact Carol Cha at (202) 512-4456, [chac@gao.gov](mailto:chac@gao.gov) or Robert Goldenkoff at (202) 512-2757, [goldenkoffr@gao.gov](mailto:goldenkoffr@gao.gov).

April 20, 2015

## 2020 CENSUS

### Recommended Actions Need to Be Implemented before Potential Cost Savings Can be Realized

## What GAO Found

The Census Bureau (Bureau) has research and testing efforts well under way to support reforming aspects of the 2020 Census in order to contain costs. The table below briefly describes the four main cost-saving initiatives and the Bureau's associated savings estimates.

2020 Census Cost-Saving Initiatives	
Description of initiative	Bureau's estimated cost savings (in billions)
Expanding use of data previously obtained by other government agencies to reduce the need for costly and labor-intensive follow-up work	\$1.2
Reengineering processes for updating the Bureau's address list and maps of the nation to reduce the need for employing field staff to walk every street in the nation to verify addresses	\$1.0
Reengineering of field operations to automate the management of enumerator work	\$2.3
Maximizing self-response of households by, among other things, offering an Internet response option	\$0.5
<b>Total</b>	<b>\$5.0</b>

Source: Census Bureau. | GAO-15-546T

Note: GAO did not verify the Bureau's cost savings estimates.

However, the Bureau faces significant challenges and unanswered questions related to these initiatives and their associated cost-savings. For example, the Bureau needs to finalize decisions on: the use of data records from other government agencies; more cost-effectively maintaining complete and accurate map and address data; and the use of technology to more efficiently manage field operations. The Bureau also needs to take action on GAO's recommendations to develop reliable cost estimates and time frames for key decisions related to deploying the Internet self-response option.

The successful execution of the 2020 Census also depends on the effective implementation of a large and complex information technology (IT) development effort. This effort—the Census Enterprise Data Collection and Processing program—is intended to result in an interconnected set of systems to serve all the Bureau's data collection and processing functions, including the systems and infrastructure needed to support the 2020 Census cost-savings initiatives. But as GAO has reported, the Bureau has not always prioritized key testing and research activities needed to inform IT system development. GAO has also previously found weaknesses in the Bureau's management of IT, and made recommendations to address them. In response, the Bureau has made important improvements in the areas of governance, system development methodologies, requirements management, and workforce planning. However, more work remains to ensure that it has the critical skills needed to effectively deliver IT solutions and that its systems and information are protected from unauthorized access or tampering.

The Bureau needs to take action to address the recommendations GAO has made in prior reports. If these actions are not taken, cost overruns, schedule delays, and performance shortfalls will likely diminish the potential cost savings that the Bureau estimates will result from redesigning the census for 2020.

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Chairman Johnson, Ranking Member Carper, and Members of the Committee:

We are pleased to be here today to discuss the U.S. Census Bureau's (Bureau) cost-savings reform initiatives and associated challenges for the 2020 Decennial Census. This month marks a critical turning point in the decade-long countdown to the next decennial: half of the time available to prepare for the 2020 enumeration is now behind the Bureau, giving greater urgency and importance to the testing, operational, and procurement decisions that it will make in the months ahead. For example, this September, the Bureau plans to announce its preliminary design for the 2020 Census, and in October 2018 the Bureau plans to have all systems and processes for the 2020 Census developed and ready for end-to-end testing. As momentum builds toward Census Day 2020, the margin for schedule slippages is getting increasingly slim.

The cost of the decennial census has steadily increased during the past 40 years, in part because the nation's population has steadily grown larger, more diverse, and increasingly difficult to enumerate. For example, at about \$13 billion, the 2010 Census was the costliest U.S. census in history and was 56 percent more costly than the \$8.1 billion 2000 Census (in constant 2010 dollars). If that growth rate continues, the 2020 Census could cost approximately \$25 billion in 2020.

Given these trends, the fundamental management challenge facing the Bureau is how to control the cost of the next enumeration while maintaining its accuracy. This is why today's hearing is so timely; our past reviews of prior decennials have underscored the importance of early and ongoing congressional oversight for keeping census preparations on track. In our remarks today, we will describe progress the Bureau has made in major 2020 Census cost-saving initiatives and critical challenges the Bureau faces in successfully delivering these initiatives.

The information in our testimony is based on our previous reports on the 2010 Census, as well as those on the Bureau's planning efforts for 2020. For this work, we, among other things, analyzed key documents such as budgets, cost estimates, plans, schedules, procedures, and guidance for selected activities, and interviewed cognizant Bureau officials at headquarters and local census offices. We did not validate the Bureau's cost-savings estimates discussed in today's statement. In addition, for the work on the 2010 Census, we made on-site observations of key enumeration activities across the country, including both urban and less-populated areas. More detail on our scope and methodology is provided in each published report on which this testimony is based. We also obtained and reviewed information on the Bureau's actions in response to

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our previous recommendations. We conducted our work in support of this testimony during April 2015.

We conducted the work on which this statement is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

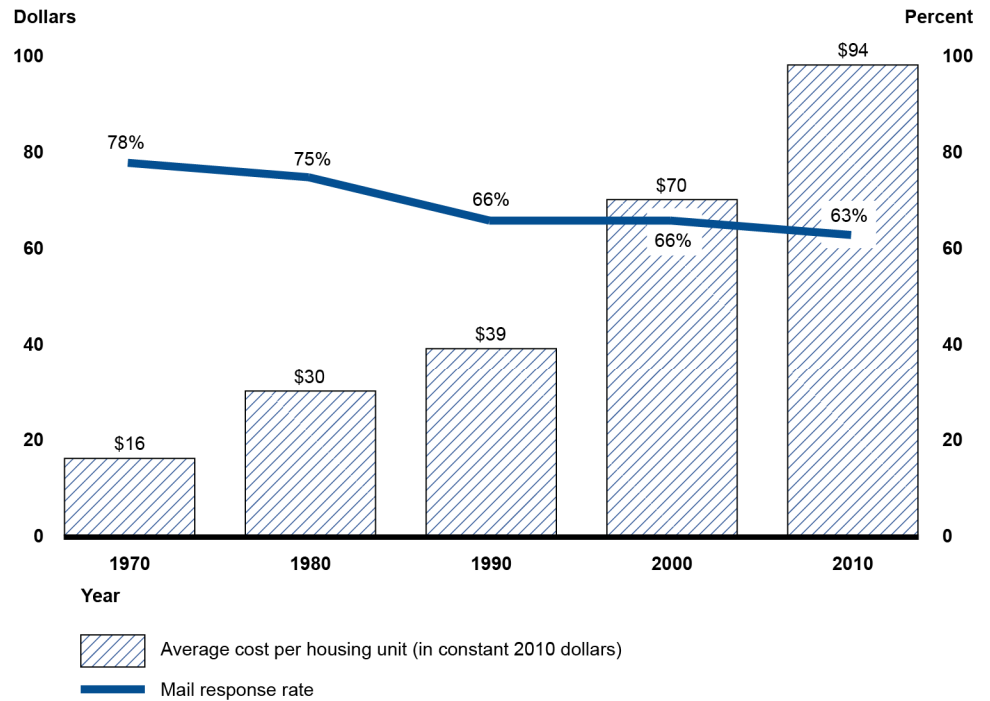
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## Background

The decennial census is mandated by the U.S. Constitution and provides data that are vital to the nation. This information is used to apportion the seats of the U.S. House of Representatives; realign the boundaries of the legislative districts of each state; allocate billions of dollars in federal financial assistance; and provide social, demographic, and economic profiles of the nation's people to guide policy decisions at each level of government.

As shown in figure 1, the cost of enumerating each housing unit has escalated from around \$16 in 1970 to around \$94 in 2010, in constant 2010 dollars (an increase of over 500 percent). At the same time, the mail response rate—a key indicator of a cost-effective enumeration—has declined from 78 percent in 1970 to 63 percent in 2010. In many ways, the Bureau has had to invest substantially more resources each decade just to try and match the results of prior enumerations.

**Figure 1: The Average Cost of Counting Each Housing Unit (in Constant 2010 Dollars) Has Escalated Each Decade, while Mail Response Rates Have Declined**



Source: GAO analysis of Census Bureau data. | GAO-15-546T

Note: In the 2010 Census the Bureau used only a short-form questionnaire. For this statement, we use the 1990 and 2000 Census short-form mail response rate when comparing 1990, 2000, and 2010 mail-back response rates. Census short-form mail response rates are unavailable for 1970 and 1980, so we use the overall response rate.

Beginning in 1990, we reported that rising costs, difficulties in securing public participation, and other long-standing challenges required a revised census methodology—a view that was shared by other stakeholders.<sup>1</sup> We and other organizations—including the Bureau itself—have stated that fundamental changes to the design, implementation, and management of the census must be made in order to address operational and organizational challenges.<sup>2</sup>

<sup>1</sup>See for example, GAO, *2000 Census: Progress Made on Design, but Risks Remain*, GAO/GGD-97-142 (Washington, D.C.: July 14, 1997), and *Decennial Census: Preliminary 1990 Lessons Learned Indicate Need to Rethink Census Approach*, GAO/T-GGD-90-18 (Washington, D.C.: Aug. 8, 1990).

<sup>2</sup>GAO, *2020 Census: Sustaining Current Reform Efforts Will Be Key to a More Cost-Effective Enumeration*, GAO-12-905T (Washington, D.C.: July 18, 2012).

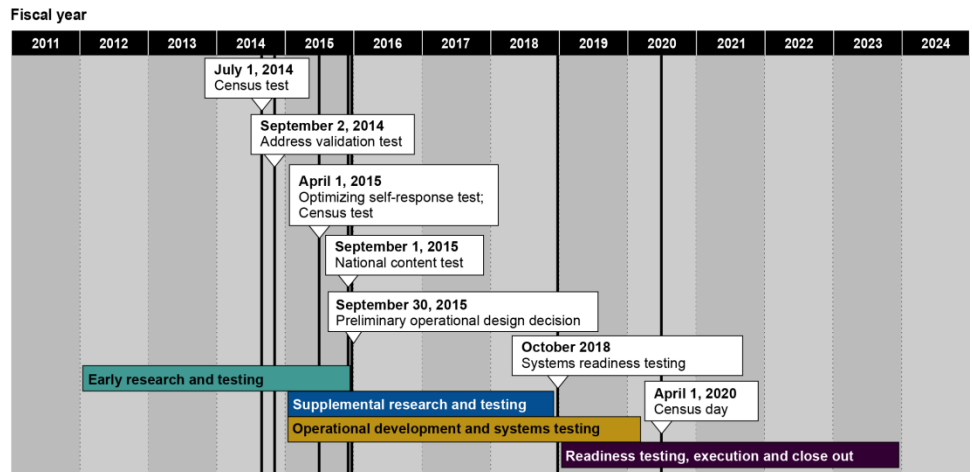
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Accordingly, in preparation for the 2020 Census, the Bureau has been researching and testing new methods and technologies to more cost-effectively count the population while maintaining high-quality results. This includes conducting several major field tests that are intended to inform the September 2015 preliminary design decision. For example, in 2014 the Bureau tested new methods for conducting self-response and non-response follow-up (referred to as the 2014 Census Test) in the Maryland and Washington, D.C., area. The Bureau is also conducting tests in 2015 that are expected to inform the design decision, including

- the Address Validation Test, which was completed in early 2015 and was used to examine new methods for updating the Bureau's address list;
- the 2015 Census Test, which is currently being conducted in Arizona to test, among other things, reengineered non-response follow-up field operations, as well as enabling enumerators to use their personally owned mobile devices to collect census data; and
- the Optimizing Self Response Test, which is currently being conducted in Savannah, Georgia, and the surrounding area and is intended to further explore methods of encouraging households to respond using the Internet, such as using advertizing and outreach to motivate respondents, and enabling households to respond without a Bureau-issued identification number.

Following its design decision, the Bureau plans to conduct additional research and testing and further refine the design through 2018. By September 2018, the Bureau plans to have fully implemented the design so that it can begin operational readiness testing. Figure 2 provides the timeline for planned 2020 Census research and testing.

**Figure 2: 2020 Decennial Census Planned Research and Testing Schedule**



Source: GAO analysis of Census Bureau data. | GAO-15-546T

## Key Challenges Need to Be Addressed before Potential Cost Savings Can Be Realized

The Bureau has been making important progress in researching and testing various design options associated with four interrelated cost-savings initiatives: using data previously provided to the government to help enumerate the population, updating the Bureau’s address list and maps of the nation, only where needed, reengineering management of field work, and maximizing self-response. Combined, the Bureau estimates these efforts could generate up to \$5 billion in cost savings and that the total life-cycle cost for the 2020 Census will be approximately \$12.7 billion.<sup>3</sup> However, we have identified various challenges and unanswered questions in these areas that, if unresolved, could affect the accuracy of the count and put the estimated cost savings at risk. The Bureau has identified or acknowledged many of these issues and is working to address them.

<sup>3</sup>GAO did not verify the Bureau’s cost savings estimates.

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## Research of Major 2020 Census Cost Savings Areas Is Well Under Way, but Challenges and Unanswered Questions Need to Be Addressed

### Using Data Previously Provided to the Government

The Bureau incurs a large part of the census' cost while following up at residences that did not return a census questionnaire. To ensure a complete count, Bureau guidance in 2010 had enumerators visit some places up to six times to try to obtain a response. In addition to being costly, such follow-up can also affect the accuracy of the count, because when census enumerators cannot contact a household, they may turn to a neighbor or some other person knowledgeable about the household to obtain the data. However, this information may be less reliable than information provided by a household member. In addition, many residences are subsequently found to be vacant or nonexistent. For example, in one operation in 2010 with the purpose of verifying whether some housing units were vacant or should be deleted from the Bureau's address list, the Bureau visited nearly 9 million housing units at a cost of about \$280 million in labor and other expenses.<sup>4</sup>

To reduce the need for these costly operations and to increase accuracy, the Bureau is testing how it might be able to expand its use of information the government already has from the administration of other programs—administrative records. The Bureau is conducting these tests in Maricopa County, Arizona, this month and has further testing planned for 2016. Examples of administrative records include Social Security Administration data and Medicare records, as well as records from state, local, and tribal governments and commercial sources. The Bureau has previously made limited use of administrative records. For example, it used U.S. Postal Service files to update its address list. The Bureau estimates that using administrative records for the 2020 Census to reduce the number of in-person visits, local census offices, and operations needed has the potential to save \$1.2 billion.

Our ongoing work and our December 2010 report<sup>5</sup> indicate that the Bureau will need to resolve a number of questions before it will be able to realize cost savings or improvements in data reliability from the use of such records, including the following:

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<sup>4</sup>GAO, *2010 Census: Data Collection Operations Were Generally Completed as Planned, but Long-standing Challenges Suggest Need for Fundamental Reforms*, [GAO-11-193](#) (Washington, D.C.: Dec. 14, 2010).

<sup>5</sup>[GAO-11-193](#).



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- **What records will meet the Bureau's needs?** The Bureau is exploring questions about the quality of other records and their completeness. Information contained in those records was collected for other purposes, so it may not always provide exactly what the Bureau needs. For example, while race and ethnicity data are collected in the census, the records available to the Bureau may not record this information. Likewise, while the Bureau needs the location of a residence for apportionment and other purposes, available records may only provide locations where people receive mail such as a post office box.
  - **To what extent does the Bureau have access to these records for operational purposes?** Some of the data the Bureau may want to use is personally identifiable information collected for other specific purposes. In some cases, the Bureau may need to enter into agreements with other agencies or levels of government to obtain access. In other cases, legislative changes may be needed to provide the Bureau with the necessary access authority. The Bureau will need to be sensitive to the time involved for these efforts so that it has the access it may need in time for 2020.
  - **To what extent will the public accept the sharing of personal data across government agencies for purposes of the census?** The Bureau and others have ongoing research exploring public perceptions on topics such as trust, the potential for decreased burden on respondents, and the social benefits of sharing data. This research is also exploring the factors relating to public outreach that the Bureau may need to focus on in order to enhance the public's acceptance of greater use of administrative records.

We have ongoing work examining the Bureau's efforts to research the use of administrative records for the 2020 Census, including the test in Maricopa County, Arizona. We anticipate issuing the results this fall.

## Reengineering How to Update the Bureau's Address List and Maps of the Nation

The Bureau relies on a complete and accurate address list to identify all households that are to receive a census questionnaire. The address list also serves as the control mechanism for following up with non-responding households. Accurate addresses and precise maps are critical for counting the population in the proper locations—the basis of congressional reapportionment, redistricting, and allocations of federal aid to state and local governments. In prior decades the Bureau employed field staff to walk almost every street in the nation as one of several operations to update the Bureau's inventory of addresses and

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geography—in 2013, we testified<sup>6</sup> that the Bureau’s 2010 address canvassing operation required 140,000 temporary workers to verify 145 million addresses at a cost of \$444 million. The Bureau has relied on this operation to help identify hidden housing units—that is, people living in, for example, converted basements or lofts—as well as changes to the address list such as from newly constructed or demolished residences.

To reduce the scope of this operation, the Bureau is focusing on areas that it believes have experienced change, such as rapid recent housing development, and for which the Bureau has no data sources capturing those changes. The Bureau is working with the U.S. Postal Service, other federal agencies, and state, local, and tribal governments on an initiative that allows government agencies at all levels to regularly share and continuously update their address lists and road data with the Bureau. To help fill in gaps and better target reduced resources, in January 2015 the Bureau solicited information from commercial firms on their capabilities to detect changes in addresses in local areas. Additionally, in February 2015 the Bureau solicited commercial proposals to provide national address or imagery datasets. The Bureau recently completed tests of some modeling methods to help identify where updates are most needed, and has additional tests planned for 2016. The Bureau estimates it will save up to \$1 billion with the successful implementation of this initiative.

Going forward, the Bureau’s success at more efficiently updating its address list and maps depends on how it resolves questions such as the following:

- **Which map and address data sources are the most cost-effective?** In October 2014, we found that the Bureau needed to implement processes for reviewing the cost and quality of data source selections and for documenting support for those decisions while documenting management approval of key data source decisions.<sup>7</sup> The Bureau agreed with our corrective recommendations and is taking steps to address them. The Bureau has ongoing research to determine how best to measure cost and quality tradeoffs in data sources.

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<sup>6</sup>GAO, *2020 Census: Progress Report on the Census Bureau’s Efforts to Contain Enumeration Costs*, [GAO-13-857T](#) (Washington, D.C.: Sep. 11, 2013).

<sup>7</sup>GAO, *2020 Census: Census Bureau Can Improve Use of Leading Practices When Choosing Address and Mapping Sources*, [GAO-15-21](#) (Washington, D.C.: Oct. 2, 2014).

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- **Will the Bureau be able to complete a nationwide continuous update of its addresses and maps in time for 2020?** With over 3,200 counties in the country, in addition to other local and state governments the Bureau might be partnering with, the Bureau has much work to do. In October 2014, we recommended that the Bureau develop a detailed plan with measurable goals for the updating initiative and track performance against these goals.<sup>8</sup> The Bureau agreed with our recommendations and is taking steps to address them. In November 2013, we also reported on weaknesses in the Bureau's scheduling practices related to its address list development activity. The Bureau recently announced it had improved the organization of its entire 2020 Census schedule to at least in part respond to these concerns.
  - **How will the Bureau decide where to conduct door-to-door canvassing?** Removing geographic areas from the possible door-to-door canvassing workload requires being able to predict which areas are stable and which areas have undetected change. The Bureau is investigating a variety of statistical models and other novel approaches, such as the use of automated tools to scan aerial imagery for new developments, to inform how to target resources.

## Reengineering the Management of Field Operations

The Bureau is researching and testing ways to more efficiently and effectively manage its multiple field operations for the 2020 Census. For example, the Bureau is researching ways to use an operational control system that automatically manages tasks and decision-making, such as case assignment and prioritization. The Bureau is also researching use of mobile devices to collect data in the field, automated human resources functions (e.g., payroll, recruiting), automated training, and reorganization of the roles of field managers. The Bureau is actively testing each of these changes alongside more traditional methods in its ongoing test in Arizona. These changes could reduce the costs for staff, training, and paper processing as well as the number of temporary census offices. The Bureau estimates it could save up to \$2.3 billion with the implementation of this initiative.

We have previously testified to this Committee about the importance of the Bureau's organizational culture and human capital planning in enabling management to achieve cost savings with its business practices

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<sup>8</sup>[GAO-15-21](#).

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and systems.<sup>9</sup> The Bureau is taking many steps that show promise, such as with its internal reorganization, and its efforts to identify critical skills gaps as we discuss later in the statement. If the Bureau is to attain the tremendous cost savings that it estimates from its field management reengineering efforts, it will need to resolve questions such as:

- **Will the Bureau be able to fully test systems, procedures, field operations and people in time for 2020?** Prior to the 2010 Census, concerns about the testing of key operations under census-like conditions led us to designate that census a high-risk program. It will be important for the Bureau to make progress in all areas of field reengineering so that it is ready for its planned end-to-end testing in 2018.

Later this year, we plan to review the Bureau's efforts in this cost savings area, as well as the IT systems that will heavily support this initiative.

### Maximizing Self-Response and Offering an Internet Option

To hold down costs, the Bureau will need higher rates of public participation, because that will reduce the need for enumerators to visit non-responding households. According to the Bureau, for the 2010 Census, approximately 635,000 employees were hired for non-response follow-up at a cost of more than \$1.6 billion. As previously mentioned, the Bureau is conducting a test in Savannah, Georgia, and the surrounding area to explore ways to encourage households to respond using the Internet with advertising and outreach. These efforts have the potential to save money by reducing the need for enumerators, printing, postage, and paper, and can speed up data collection. The Bureau estimates these efforts could save around \$500 million.

We reported in February 2015<sup>10</sup> that the Bureau's efforts to deliver an Internet response option were under way. These efforts included developing a web application for use in major field tests, as well as researching methods for promoting the Internet response option and allowing households to respond online without a Bureau-issued identification number (to authenticate respondents). However, the Bureau had yet to establish reliable estimates of how much it will cost to deliver an Internet response option. Moreover, the Bureau did not have

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<sup>9</sup>GAO, *2010 Census: Preliminary Lessons Learned Highlight the Need for Fundamental Reforms*, [GAO-11-496T](#) (Washington, D.C.: Apr. 6, 2011).

<sup>10</sup>GAO, *2020 Census: Key Challenges Need to Be Addressed to Successfully Enable Internet Response*, [GAO-15-225](#) (Washington, D.C.: Feb. 5, 2015).

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integrated schedules for completing the work, nor did it have plans and time frames for addressing IT infrastructure scalability needs. For example, the Internet response option for the 2020 Census is expected to require a much greater data processing and storage capacity than the Bureau's existing IT infrastructure can support, and Bureau officials stated that they plan to use a cloud environment to provide the increased IT infrastructure.<sup>11</sup>

The Bureau was not positioned to answer research questions critical to determining how much larger it should scale its IT infrastructure in time for the upcoming September 2015 design decision. We also found the Bureau had not yet established high-level time frames for when key cloud computing decisions needed to be made. Bureau IT Directorate officials stated that they had not yet established time frames due to a lack of internal cloud computing expertise and that they were planning to use a contractor to assist in assessing cloud computing technologies for the 2020 Census. While this assistance may be helpful, without, at a minimum, high-level time frames, the Bureau will not know whether there is enough time to successfully acquire and implement a cloud solution for the 2020 Census.

In our February 2015 report, we recommended that the Bureau update estimated costs for the Internet response option and ensure future cost estimates are reliable, develop methodologies for answering key research questions, and establish high-level time frames for cloud computing decisions. The Bureau neither agreed nor disagreed with the recommendations but identified actions to address some of them. For example, the Bureau stated that it planned to revise the 2020 Census cost estimate once the September 2015 design decision is made. The Bureau also stated that it had established a plan and implementation team—the 2020 Census Concept of Operations—to document results of the design decision, including the Internet self-response rate and key dates for making decisions.

In addition to these challenges, the Bureau will need to resolve other operational questions before it can realize cost savings in this area, including the following:

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<sup>11</sup>Cloud computing is a means for establishing on-demand access to shared and scalable pools of computing resources.

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- **What methods work best to convince diverse audiences to self-respond in a digital environment?** In the Savannah, Georgia, test, the Bureau is exploring how to target various audiences through social media, such as Twitter and Facebook, and the effect on response rates over the Internet.
  - **How can non-Internet response options be improved, for those without access to the Internet?** The Bureau has historically provided support for completing questionnaires at locations within communities and over the telephone. The Bureau will need to examine how if at all it can improve such efforts to help people complete their questionnaires.

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## Major 2020 Census Cost Saving Initiatives Rely on, among Other Things, Effective Implementation of a Large and Complex IT Development Effort

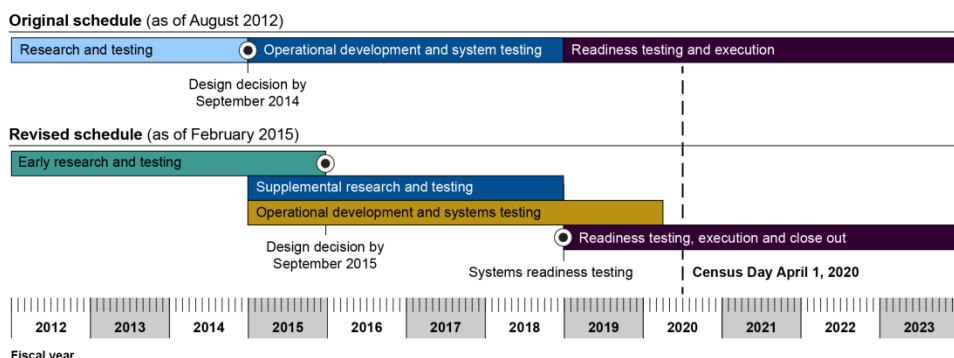
In October 2014, the Bureau initiated an enterprise-wide IT initiative called the Census Enterprise Data Collection and Processing (CEDCAP) program, which is intended to deliver a “system of systems” to serve all of the Bureau’s survey data collection and processing functions—rather than continuing to build and maintain unique, survey-specific systems with redundant capabilities. Most importantly for the 2020 Census, CEDCAP is expected to deliver the systems and IT infrastructure needed to implement the Bureau’s cost-savings initiatives. For example:

- To reengineer field work, CEDCAP is expected to implement a new dynamic operational control system to track and manage field work that can make decisions on which visits enumerators should attempt on a daily basis using real-time data, as well as provide automated route planning to make enumerator travel more efficient. CEDCAP also includes testing the use of mobile devices, either government-furnished or employee-owned, to automate data collection in the field.
- To maximize self-response with the use of the Internet response option, CEDCAP is responsible for developing and testing a web-based survey application and exploring options for establishing the IT infrastructure to support the increased volume of data processing and storage.

CEDCAP is a large and complex modernization program, consisting of 14 projects that are to deliver CEDCAP capabilities incrementally, through the deployment of over 10 versions. The Bureau expects to reuse selected systems, make modifications to other systems, and develop or acquire additional systems and infrastructure. As of March 2015, the CEDCAP program was projected to cost about \$548 million through 2020.

The September 2015 design decision that is expected to result from the Bureau’s ongoing research and testing is also intended to drive the business requirements for the systems and infrastructure that CEDCAP will be expected to deliver. However, as noted in our April 2014 report, the Bureau had not prioritized key IT research and testing needed for the fast-approaching September 2015 design decision.<sup>12</sup> Specifically, the Bureau was not completing the necessary plans and schedules for research and testing efforts and prioritizing what needs to be done by September 2015—a milestone that had already been pushed back by a year (see fig. 3) and cannot afford to slip further. We concluded that, given the current trajectory and the lack of supporting schedules and plans, it was unlikely that all planned IT-related research and testing activities would be completed in time to support the September 2015 design decision.

**Figure 3: Original and Revised Schedules for 2020 Decennial Census Design Decision**



These findings were particularly concerning since we had reported in November 2012 that, during the early stages of research and testing, key research and testing project plans were incomplete.<sup>13</sup> Even though we recommended at that time that the Bureau ensure that documentation for projects was complete and the Bureau agreed, incomplete project plans continued to be an issue 2 years later.

<sup>12</sup>GAO, *2020 Census: Prioritized Information Technology Research and Testing Is Needed for Census Design Decisions*, [GAO-14-389](#) (Washington, D.C.: Apr. 3, 2014).

<sup>13</sup>GAO, *2020 Census: Initial Research Milestones Generally Met but Plans Needed to Mitigate Highest Risks*, [GAO-13-53](#) (Washington, D.C.: Nov. 7, 2012).

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In light of these ongoing challenges, we recommended in our April 2014 report that the Bureau prioritize its IT-related research and testing projects that need to be completed to support the design decision and develop schedules and plans to reflect the new prioritized approach. The Bureau agreed with our recommendations and has taken steps to address them. For example, in September 2014, the Bureau released a plan that identified inputs, such as research questions, design components, and testing, that was needed to inform the September 2015 design decision.

However, as we reported in February 2015,<sup>14</sup> the Bureau had not yet determined how key IT research questions that had been identified as critical inputs into the design decision—estimating the Internet self-response rate and determining the IT infrastructure for security and scalability needed to support Internet response—were to be answered. Bureau officials stated that they had begun to establish projects responsible for addressing these questions, but they did not have time frames for when these new projects would develop a planned research methodology. We emphasized that, with 8 months remaining until the design decision was to be made and major tests already designed or completed, the Bureau had limited time to determine how these critical questions would be answered to inform a key design decision.

Given the Bureau's prior and existing challenges, as well as the importance of CEDCAP to the successful delivery of an accurate, efficient, and secure 2020 Census, we identified CEDCAP as an IT investment in need of attention in our February 2015 High-Risk report.<sup>15</sup> We plan to conduct a review of the CEDCAP program for this Committee later this year.

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## Census Bureau Has Demonstrated Improvements in IT Management, but Faces Critical Gaps in IT Workforce and Information Security

As we have previously reported, the Bureau's past efforts to implement new approaches and IT systems have not always gone well. For

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<sup>14</sup>[GAO-15-225](#).

<sup>15</sup>Every 2 years at the start of a new Congress, GAO calls attention to agencies and program areas that are high risk due to their vulnerabilities to fraud, waste, abuse, and mismanagement, or are most in need of transformation. As part of a new entry into the February 2015 update to our High-Risk Series focused on improving the management of IT government-wide, we identified CEDCAP as an IT investment—among others across the federal government—in need of the most attention. See GAO, *High-Risk Series: An Update*, [GAO-15-290](#) (Feb. 11, 2015).



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example, leading up to the 2010 Census, fundamental weaknesses in key IT management practices contributed to the Bureau not being able to successfully deploy custom-developed handheld enumeration devices for non-response follow-up, which increased the cost of that Census by up to \$3 billion. The Bureau has made progress in practices related to IT governance and requirements management, but more work is needed to address critical workforce gaps and information security.

### Progress Made in IT Governance and Requirements Management

Institutionalizing key IT management controls, such as IT governance, system development methodology, and requirements management processes, helps establish a consistent and repeatable process for managing and overseeing IT investments and reduces the risk of experiencing cost overruns, schedule slippages, and performance shortfalls, like those that affected the previous census.

The Bureau has made progress in strengthening these areas in response to recommendations we made in September 2012.<sup>16</sup> Specifically, we found that the Bureau lacked a sufficiently mature IT governance process to ensure that investments are properly controlled and monitored, and did not have a comprehensive system development methodology, and that effective requirements management continued to be a long-standing challenge for the Bureau. We made several recommendations to address these issues, and the Bureau took actions to fully implement all of them. For example, the Bureau

- addressed gaps in policies and procedures related to IT governance, such as establishing guidelines on the frequency of investment review board meetings and thresholds for escalation of cost, risk, or impact issues;
- finalized its adoption of an enterprise system development life-cycle methodology, which included the short incremental development model, referred to as Agile, and a process for continuously improving the methodology based on lessons learned; and
- implemented a consistent requirements development tool that includes guidance for developing requirements at the strategic mission, business, and project levels and is integrated with its enterprise system development life-cycle methodology.

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<sup>16</sup>GAO, *Information Technology: Census Bureau Needs to Implement Key Management Practices*, [GAO-12-915](#) (Washington, D.C.: Sept. 18, 2012).

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As a result, the Bureau has established a consistent process for managing and overseeing its IT investments.

### IT Workforce Planning Has Improved, but Critical Gaps Continue to Exist

Effective workforce planning is essential to ensure organizations have the proper skills, abilities, and capacity for effective management. While the Bureau has made progress in IT workforce planning efforts, many critical IT competency gaps remain to be filled. In September 2012 we reported, among other things, that the Bureau had not developed a Bureau-wide IT workforce plan; identified gaps in mission-critical IT occupations, skills, and competencies; or developed strategies to address gaps.<sup>17</sup>

Accordingly, we recommended that the Bureau establish a repeatable process for performing IT skills assessments and gap analyses and establish a process for directorates to coordinate on IT workforce planning. In response, in 2013 the Bureau completed an enterprise-wide competency assessment and identified several mission-critical gaps in technical competencies. In 2014 the Bureau established documents to institutionalize a strategic workforce planning process, identified actions and targets to close the competency gaps by December 2015, and established a process to monitor quarterly status reports on the implementation of these actions.

These are positive steps in establishing strategic workforce planning capabilities; however, more work remains for the Bureau to close competency gaps critical to the implementation of its IT efforts. As we reported in February 2015, the Bureau's workforce competency assessment identified several mission-critical gaps that would challenge its ability to deliver IT-related initiatives, such as the IT systems that are expected to be delivered by CEDCAP.<sup>18</sup> For example, the Bureau found that competency gaps existed in cloud computing, security integration and engineering, enterprise/mission engineering life-cycle, requirements development, and Internet data collection. The Bureau also found that enterprise-level competency gaps existed in program and project management, budget and cost estimation, systems development, data analytics, and shared services. The Bureau's efforts to monitor the status of its efforts to close these competency gaps will be critical to ensuring

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<sup>17</sup>GAO-12-915.

<sup>18</sup>GAO, *2020 Census: Key Challenges Need to Be Addressed to Successfully Enable Internet Response*, GAO-15-225 (Washington, D.C.: Feb. 5, 2015).

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the Bureau has the skills it needs to effectively deliver IT solutions for the 2020 Census.

### Limited Assurance That Information Systems Are Adequately Secured

Critical to the Bureau's ability to perform its data collection and analysis duties are its information systems and the protection of the information they contain. A data breach could result in the public's loss of confidence in the Bureau, thus affecting its ability to collect census data. To ensure the reliability of their computerized information, agencies should design and implement controls to prevent, limit, and detect unauthorized access to computing resources, programs, information, and facilities.<sup>19</sup>

Inadequate design or implementation of access controls increases the risk of unauthorized disclosure, modification, and destruction of sensitive information and disruption of service.

In January 2013, we reported on the Bureau's implementation of information security controls to protect the confidentiality, integrity, and availability of the information and systems that support its mission.<sup>20</sup> We concluded that the Bureau had a number of weaknesses in controls intended to limit access to its systems and information, as well as those related to managing system configurations and unplanned events. We attributed these weaknesses to the fact that the Bureau had not fully implemented a comprehensive information security program, and made 115 recommendations aimed at addressing these deficiencies.<sup>21</sup> The Bureau expressed broad agreement with the report and said it would work to find the best ways to address our recommendations.

However, to date, the Bureau has fully addressed only 19 of the 115 recommendations, and while it is making progress on others, significant work remains. For example, the Bureau has implemented elements of a comprehensive information security program, such as establishing appropriate policies and procedures, providing security awareness

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<sup>19</sup>Access controls include those related to (1) protection of system boundaries, (2) identification and authentication, (3) authorization, (4) cryptography, (5) audit and monitoring, and (6) physical security.

<sup>20</sup>GAO, *Information Security: Actions Needed by Census Bureau to Address Weaknesses*, [GAO-13-63](#) (Washington, D.C.: Jan. 22, 2013). Another version of this report was issued for limited distribution.

<sup>21</sup>This included 13 public recommendations and 102 recommendations for limited distribution.

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training, and addressing incident response weaknesses; however, among many other things, it is not yet comprehensively assessing risk.

Given that the Bureau is considering using IT systems to collect the public's personal information for the 2020 Census in ways that it has not in previous censuses (e.g., web-based surveys, cloud computing, and enabling enumerators to use their personally owned mobile devices to collect census data), implementing our security recommendations from over 2 years ago must be a high priority. Until then, the Bureau will have limited assurance that its information and systems, including those needed for the 2020 Census, are being adequately protected against unauthorized access, use, disclosure, modification, disruption, or loss.

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In summary, the Bureau is pursuing initiatives to significantly reform its outdated and inefficient methods of conducting decennial censuses. However, with only 3-and-a-half years remaining until the Bureau plans to have all systems and processes for the 2020 Census developed and ready for end-to-end system testing, the magnitude of the planned changes, the Bureau's prior track record, and existing challenges, the 2020 Census program faces significant risk. As the Bureau approaches the September 2015 preliminary decision deadline, it needs to ensure that it only commits to what its capacity can truly accommodate. In addition, the Bureau will need to ensure that quality and information security are effectively managed in a census design that may entail significant change. Moreover, the Bureau needs to take action to address the specific challenges we have highlighted in prior reports. If these actions are not taken, cost overruns, schedules delays, and performance shortfalls may diminish the potentially significant cost savings that the Bureau estimates will result from redesigning the census for 2020.

Chairman Johnson, Ranking Member Carper, and Members of the Committee, this completes our prepared statement. We would be pleased to respond to any questions that you may have.

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## Contacts and Acknowledgments

If you have any questions concerning this statement, please contact Carol Cha, Director, Information Technology Acquisition Management Issues, at (202) 512-4456 or [chac@gao.gov](mailto:chac@gao.gov) or Robert Goldenkoff, Director, Strategic Issues, at (202) 512-2757 or [goldenkoff@gao.gov](mailto:goldenkoff@gao.gov). Other individuals who made key contributions include Shannin O'Neill and Ty Mitchell, Assistant Directors; Jeffrey DeMarco, Lee McCracken, Jeanne Sung, and Timothy Wexler.

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