GAO

United States Government Accountability Office

Report to Congressional Requesters

August 2018

2020 CENSUS

Continued Management Attention Needed to Address Challenges and Risks with Developing, Testing, and Securing IT Systems

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Why GAO Did This Study

One of the Bureau's most important functions is to conduct a complete and accurate decennial census of the U.S. population. The decennial census is mandated by the Constitution and provides vital data for the nation. The Bureau plans to significantly change the methods and technology it uses to count the population with the 2020 Census, such as by offering an option for households to respond to the survey via the Internet. In preparation for the 2020 Census, the Bureau is conducting a test of all key systems and operations (referred to as the 2018 End-to-End Test), which began in August 2017 and runs through April 2019.

GAO was asked to review the Bureau's IT readiness for the 2020 Census. This report (1) determines the Bureau's progress in developing and testing systems for the 2018 End-to-End Test and (2) describes the challenges and risks that the Bureau has faced in implementing and securing these systems. To do this, GAO reviewed key documentation, including plans for system development and testing, and outcomes of key IT milestone reviews and security assessments.

What GAO Recommends

Over the past decade, GAO has made 93 recommendations specific to the 2020 Census to address the issues raised in this and other products. As of August 2018, the Bureau had implemented 61 recommendations, and had taken initial steps—including developing action plans—to implement the other 32 recommendations. GAO is not making additional recommendations in this report.

View GAO-18-655. For more information, contact Nick Marinos at (202) 512-9342 or marinosn@gao.gov.

What GAO Found

The Census Bureau (Bureau) has continued to make progress in developing and testing information technology (IT) systems for the 2020 Census. Specifically, as of June 2018, the Bureau had completed all development activities for 36 of the 44 systems needed to support the 2018 End-to-End Test, and was in the process of completing these activities for the remaining 8 systems. In addition, the Bureau had completed all system and integration testing activities for 20 of the 44 systems, and was in the process of conducting these activities for the remaining 24 systems.

Nevertheless, the Bureau continues to face significant challenges and risks in its efforts to manage the schedules, contracts, costs, and cybersecurity of its 2020 Census systems.

- **Schedule management**: The Bureau's schedule for developing systems to support the 2018 End-to-End Test has experienced delays. These delays have compressed the time available for system and integration testing, and several systems experienced problems during the 2018 End-to-End Test. In addition, the Bureau is currently revising the system development and testing schedule for the 2020 Census as a result of challenges experienced and lessons learned while completing these activities during the 2018 End-to-End Test. Continued schedule management challenges may compress the time available for the remaining system and integration testing and increase the risk that systems will not function as intended.

- **Contractor oversight**: Among other challenges, the Bureau is still filling vacancies in the government program management office that is overseeing its key integration contractor. In June 2018, Bureau officials reported that 33 of the office's 58 federal employee positions were vacant. This adds risk that the office may not be able to provide adequate oversight of contractor cost, schedule, and performance.

- **IT cost growth**: The Bureau reported that its estimated IT costs had grown from $3.41 billion in October 2015 to $4.97 billion in December 2017—an increase of $1.56 billion. This increase was due, in large part, to the addition of technical integration services and updated costs for other major contracts (such as the contract for mobile devices). The amount of cost growth since the October 2015 estimate raises questions as to whether the Bureau has a complete understanding of the IT costs associated with the 2020 Census.

- **Cybersecurity**: The Bureau has made progress by completing the security assessments for 33 of the 44 systems needed to support the 2018 End-to-End Test. However, as of June 2018, the Bureau had identified nearly 3,100 security weaknesses that will need to be addressed in the coming months. Because the 2020 Census involves collecting personal information from over a hundred million households across the country, it will be important that the Bureau addresses system security weaknesses in a timely manner and ensures that risks are at an acceptable level before systems are deployed.

With the 2020 Census less than 2 years away, it is critical that the Bureau address these challenges and risks to ensure that its IT systems are developed, tested, and secured in time to support the count of the nation's population.

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Abbreviations

Bureau	U.S. Census Bureau
CEDCaP	Census Enterprise Data Collection and Processing
CIO	chief information officer
Commerce	Department of Commerce
FISMA	Federal Information Security Management Act of 2002 and Federal Information Security Modernization Act of 2014
FITARA	Federal Information Technology Acquisition Reform Act
IT	information technology
NIST	National Institute of Standards and Technology
OMB	Office of Management and Budget
POA&M	plan of action and milestones
PII	personally identifiable information

August 30, 2018

Congressional Requesters

Conducting the decennial census of the U.S. population is mandated by the Constitution and provides vital data for the nation. The information that the census collects is used to apportion the seats of the House of Representatives; redraw congressional districts; allocate billions of dollars each year in federal financial assistance; and provide a social, demographic, and economic profile of the nation's people to guide policy decisions at each level of government. Further, businesses use census data to market new services and products and to tailor existing ones to demographic changes.

For 2020, a complete count of the nation's population is an enormous undertaking. The U.S. Census Bureau (Bureau), a component of the Department of Commerce (Commerce), is seeking to control the cost of the census while it implements several innovations and manages the processes of acquiring and developing information technology (IT) systems. However, in recent years, we have identified challenges that raise serious concerns about the Bureau's ability to conduct a cost-effective count of the nation, including issues with the agency's research, testing, planning, scheduling, cost estimation, systems development, and cybersecurity practices. We also added the 2020 Census to GAO's high-risk list in February 2017.[1]

Currently, the Bureau is conducting the 2018 End-to-End Test, which began in August 2017 and runs through April 2019. This effort is the Bureau's final opportunity to test all key systems and operations in a census-like environment to ensure readiness for the 2020 Census.

Given the importance of the IT systems to the 2018 End-to-End Test and the 2020 Census, you asked us to review the Bureau's IT readiness for the 2020 Census. Our specific objectives were to (1) determine the progress that the Bureau has made in developing and testing the critical

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[1]GAO, *High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others*, GAO-17-317 (Washington, D.C.: Feb. 15, 2017). GAO maintains a high-risk program to focus attention on government operations that it identifies as high risk due to their greater vulnerabilities to fraud, waste, abuse, and mismanagement or the need for transformation to address economy, efficiency, or effectiveness challenges.

IT systems for the 2018 End-to-End Test, and (2) describe the challenges and risks that the Bureau has faced in implementing and securing these systems.

To determine the progress in developing and testing systems for the 2018 End-to-End Test, we updated information related to our recent work on the Bureau's system development and testing efforts.[2] To do this, we reviewed relevant Bureau documentation on the 44 IT systems in the 2018 End-to-End Test, including the 2020 Census Operational Plan, the Bureau's system integration and implementation plan, outcomes of key IT milestone reviews, and requirements traceability matrices. We also interviewed agency officials, including the Chief Information Officer (CIO), the Associate Director for Decennial Census Programs, and officials from the Bureau's technical integration contractor.

To describe the challenges and risks that the Bureau has faced in implementing and securing these systems, we reviewed Bureau documentation, including risk and issue registers, meeting minutes from 2020 Census executive review meetings, and presentations from bi-monthly meetings from the Bureau's technical integration contractor. We also reviewed documentation discussing the Bureau's progress in mitigating or addressing the risks and challenges, including plans for 2020 Census system development and testing, deliverables from key contractors (including the technical integration contractor), the basis of estimate documentation for the 2020 Census cost estimate developed in December 2017, results of 2020 Census executive review board meetings, outcomes from security assessments, and the Bureau's list of plans of action and milestones (POA&Ms). In addition, we interviewed relevant agency officials, including the CIO and the Chief Information Security Officer.

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[2]For example, GAO, *2020 Census: Actions Needed to Mitigate Key Risks Jeopardizing a Cost-Effective and Secure Enumeration,* GAO-18-543T (Washington, D.C.: May 8, 2018); *2020 Census: Continued Management Attention Needed to Mitigate Key Risks Jeopardizing a Cost-Effective and Secure Enumeration,* GAO-18-416T (Washington, D.C.: Apr. 18, 2018); *2020 Census: Actions Needed to Mitigate Key Risks Jeopardizing a Cost-Effective Enumeration,* GAO-18-215T (Washington, D.C.: Oct. 31, 2017); *2020 Census: Continued Management Attention Needed to Oversee Innovations, Develop and Secure IT Systems, and Improve Cost Estimation,* GAO-18-141T (Washington, D.C.: Oct. 12, 2017); *2020 Census: Sustained Attention to Innovations, IT Systems, and Cost Estimation Is Needed,* GAO-17-584T (Washington, D.C.: May 3, 2017); and *Information Technology: Better Management of Interdependencies between Programs Supporting 2020 Census Is Needed,* GAO-16-623 (Washington, D.C.: Aug. 9, 2016).

We conducted this performance audit from August 2016 to August 2018 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.

Background

For the 2020 Census, the Bureau is significantly changing how it intends to conduct the census, in part by re-engineering key census-taking methods and infrastructure, and making use of new IT applications and systems. For example, the Bureau plans to offer an option for households to respond to the survey via the Internet and enable field-based enumerators[3] to use applications on mobile devices to collect survey data from households. In December 2017, the Bureau estimated the total cost of the redesigned 2020 Census to be about $15.6 billion, more than $3 billion higher than it estimated in October 2015.

To inform the design of the 2020 Census operations and systems, the Bureau held several major operational tests. These tests included (1) the 2016 Census tests in Texas and California, which evaluated, among other things, the efficiency of non-response follow-up[4] using contractor-provided mobile devices; and (2) the 2017 Census Test—a nationwide sample of how individuals respond to Census questions using paper, the Internet, or the phone—which evaluated key new IT components, such as the Internet self-response system and the use of a cloud-based infrastructure.

Currently, the Bureau is conducting the 2018 End-to-End Test, which began in August locations—Rhode Island, West Virginia, and Washington state. The Bureau is currently testing its non-response operation in Rhode

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[3]Enumerators are Census Bureau employees who travel from door-to-door throughout the country to try to obtain census data from individuals who do not respond through other means, including the Internet, on paper, or by phone.

[4]In non-response follow-up, if a household does not respond to the census by a certain date, the Bureau will conduct an in-person visit by an enumerator to collect census data using a mobile device provided by the Bureau.

Island.[5] This operation began in May 2018 and is scheduled to conclude in August 2018.

The Bureau Plans to Rely Heavily on IT for the 2018 End-to-End Test and the 2020 Census

The Bureau plans to rely heavily on both new and legacy IT systems and infrastructure to support the 2018 End-to-End Test and the 2020 Census operations. For example, the Bureau's plans call for deploying and using 44 systems in the 2018 End-to-End Test. Eleven of these systems are currently being developed or modified as part of an enterprise-wide initiative called Census Enterprise Data Collection and Processing (CEDCaP).[6] This initiative is a large and complex modernization program intended to deliver a system-of-systems to support all of the Bureau's survey data collection and processing functions, rather than continuing to rely on unique, survey-specific systems with redundant capabilities.

As part of the 2018 End-to-End Test, the Bureau plans to incrementally test, deploy, and use the 44 systems from December 2016 through the end of the test in April 2019.[7] These systems are to be deployed in 14 groups based on the operations that they support in the test, including address canvassing, self-response (i.e., Internet, phone, or paper), field enumeration, and tabulation and dissemination. A system may be deployed for one operation in the 2018 End-to-End Test (such as address canvassing), and then be deployed again for a subsequent operation in the test (such as field enumeration).

Following the 2018 End-to-End Test, the Bureau has additional system development and testing activities planned leading up to the 2020 Census. Specifically, Bureau officials said they expect that the 44 systems used in the 2018 End-to-End Test will need to undergo further development and testing due to, among other things, the need to add

[5]The Bureau originally planned to perform the entire 2018 End-to-End Test in all three locations. However, in May 2017, the Bureau scaled back the operational scope of the test and, of the three planned test sites, the Bureau would fully implement the test in the Rhode Island site only.

[6]The Bureau is pursuing enterprise-wide technology solutions intended to support other major surveys the Bureau conducts as well, such as the American Community Survey and the Economic Census.

[7]Prior to deployment in the 2018 End-to-End Test, the systems are to undergo various forms of testing, including system-level testing to ensure that the system meets business requirements, and integration testing to validate (among other things) the interfaces between systems.

functionality that was not part of the end-to-end test, scale system performance to support the number of respondents expected during the 2020 Census, and to address system defects identified during the 2018 End-to-End Test. Bureau officials also reported that they plan to use an additional 8 systems that were not included in the 2018 End-to-End Test—for a total of 52 systems—to carry out the 2020 Census operations.[8]

As of June 2018, the Bureau planned to deploy the 52 systems for the 2020 Census in four groups, or operational releases, to support the key operations in the 2020 Census: (1) recruiting and hiring; (2) address canvassing; (3) self-response, non-response follow-up, and fraud detection; and (4) reporting and coverage measurement.[9] The systems are grouped according to the operations that they support during the 2020 Census. For example, the third operational release—which includes the most systems—has 47 systems to be used for self-response (including via the Internet), non-response follow-up, and fraud detection.

In addition to its systems and applications, the Bureau is designing, configuring, and managing the IT infrastructure needed for the 2020 Census. The Bureau's 2020 Census infrastructure includes: (1) an on premises data center being managed by the Bureau; (2) an on premises data center being managed by the Bureau's technical integration contractor; (3) a cloud-based infrastructure using Amazon Web Services being managed by the technical integration contractor; (4) hardware located at the National Processing Center for printing and mailing systems; and (5) hardware managed and located elsewhere for those systems that are provided as software-as-a-service.[10]

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[8]Several of these systems are for the coverage measurement operation, which was removed from the scope of the 2018 End-to-End Test. Coverage measurement evaluates the quality of the census data by estimating the census coverage based on a post-enumeration survey.

[9]Similar to the 2018 End-to-End Test, a system being used in the 2020 Census may be deployed multiple times (with additional or new functionality) if that system is needed for more than one of these operations.

[10]Software-as-a-service involves purchasing commercial software that is operated and maintained by a commercial vendor. Examples of systems that the Bureau has acquired as software-as-a-service include Census Questionnaire Assistance (the phone response system), and Recruiting and Assessment.

The Bureau Has Made Progress in Developing and Testing Its IT Systems for the 2018 End-to-End Test

The Bureau has made progress in developing and testing the IT systems for the 2018 End-to-End Test. In this regard, it has finished developing a majority of the 44 systems in the test. Specifically, as of June 2018, the Bureau had completed all development activities for 36 of the 44 systems in the test, and was in the process of completing these activities for the remaining 8 systems. Figure 1 summarizes the development status for the 44 systems planned for the 2018 End-to-End Test, as of June 2018.

Figure 1: Development Status for the 44 Systems in the Census Bureau's 2018 End-to-End Test, as of June 2018
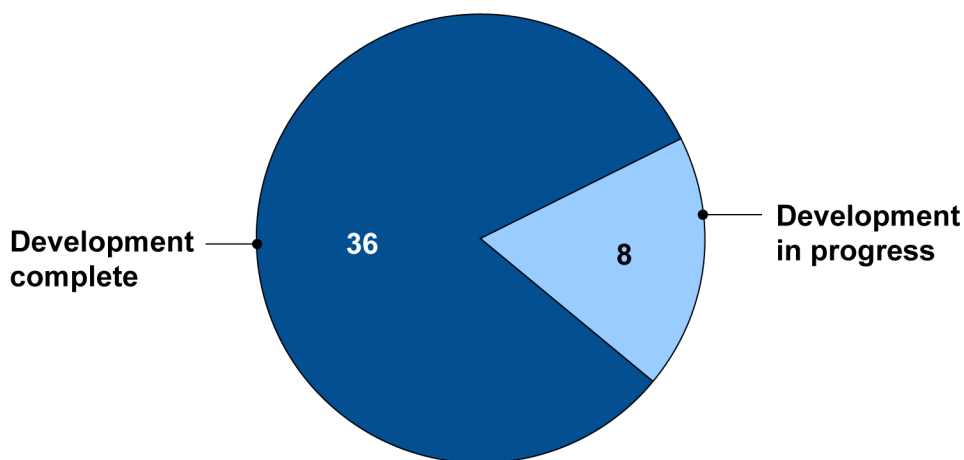
Source: GAO analysis of Census Bureau data. | GAO-18-655

In addition, as of June 2018, the Bureau had completed all testing activities (e.g., system and integration testing) for 20 of the 44 systems included the 2018 End-to-End Test, and was in the process of conducting these tests for the remaining 24 systems. Figure 2 summarizes the status of testing for the 44 systems in the 2018 End-to-End Test. Further, appendix I provides additional details about the status of the development and testing activities for these systems.
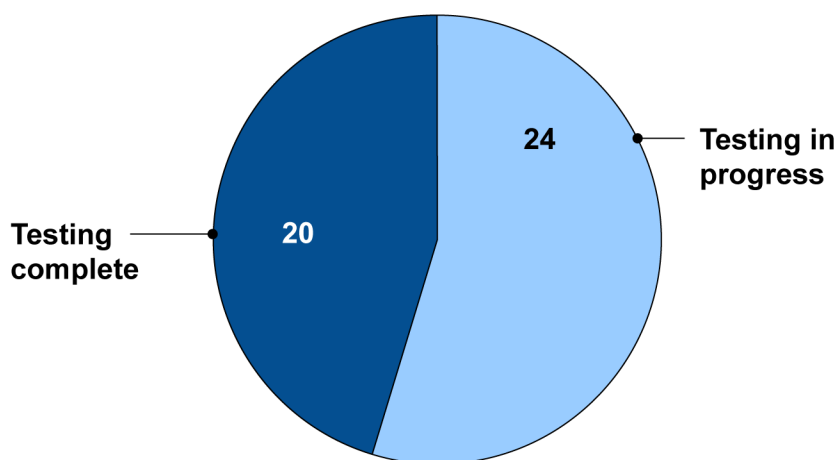
Figure 2: Testing Status for the 44 Systems in the Census Bureau's 2018 End-to-End Test, as of June 2018

Source: GAO analysis of Census Bureau data. | GAO-18-655

In total, as of June 2018, the Bureau had completed all development and testing activities to support 10 of the 14 operations in the 2018 End-to-End Test, such as in-field address canvassing and response processing.[11] For the remaining 4 operations—field enumeration, group quarters enumeration, fraud detection, and reporting—system development and/or testing activities were in process, but had not been completed. Figure 3 depicts the total number of systems supporting each operation, the number of systems that have completed development and testing, and the status of the operation.

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[11]As stated previously, the 44 systems in the test are to be deployed multiple times in a series of operations (such as group quarters enumeration). That is, a system may be deployed for one operation in the 2018 End-to-End Test (such as address canvassing), and be deployed again for a subsequent operation in the test (such as group quarters enumeration). As such, additional development and testing is to occur each time a system is deployed.

Figure 3: Development and Testing Status for System Operations in the Census Bureau's 2018 End-to-End Test, as of June 2018

Status of system development and testing

Operation	Total number of systems in the operation	Number of systems that have completed development	Number of systems that have completed testing
In-office address canvassing	3	3	3
Address canvassing recruiting	12	12	12
Address canvassing training	13	13	13
In-field address canvassing imagery	16	16	16
In-field address canvassing operational control	21	21	21
Field enumeration recruiting	16	16	16
Printing and mailing, and self-response	23	23	23
Field enumeration, including non-response follow-up[a]	31	31	28
Field enumeration training	17	17	17
Response processing	1	1	1
Group quarters self-response	22	22	22
Group quarters field enumeration	24	24	6
Fraud detection	8	2	
Reporting	11	5	1

Number of systems (0, 5, 10, 15, 20, 25, 30)

Legend:
- Total number of systems in the operation
- Number of systems that have completed development
- Number of systems that have completed testing

Source: GAO analysis of Census Bureau data. | GAO-18-655

[a]In addition to non-response follow-up, field enumeration also includes operations such as update/leave and coverage improvement. In update/leave, listers update a housing unit's address and leave a questionnaire to allow the household to self-respond. The goal of coverage improvement

is to resolve erroneous enumerations (such as people counted in the wrong place or more than once) and omissions.

The Bureau Continues to Face Challenges and Risks in Implementing Its IT Systems for the 2020 Census

Even as the Bureau has made progress in its system development and testing activities, it continues to face challenges in managing and overseeing the development and testing of its IT systems for the 2018 End-to-End Test and the 2020 Census. Specifically, we have noted challenges in the Bureau's efforts to manage the schedules, contracts, costs, governance and internal coordination, and cybersecurity of its systems.

Schedule management

The Bureau has faced significant challenges in managing its schedule for developing and testing systems for the 2018 End-to-End Test. Further, due, in part, to these challenges, the Bureau is replanning key IT milestones for the 2020 Census.

In May 2018, we reported that the Bureau had delayed by several months key IT milestone dates (e.g., dates to begin system integration testing) for a majority of the 14 operations in the 2018 End-to-End Test.[12] For example, the Bureau moved the test readiness review date for the fraud detection operation from April 2018 to July 2018—a delay of 3 months. These delays have compressed the time the Bureau has had for integration testing before the systems are deployed in the 2018 End-to-End Test.

Several of the systems subsequently experienced problems during the end-to-end test, including the mobile device applications being used by enumerators for the non-response follow-up[13] operation of the test.[14] For example, Bureau officials reported that enumerators have experienced problems with the sensitivity of the mobile devices' touch screen. More

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[12]GAO-18-543T.

[13]In non-response follow-up, if a household does not respond to the census by a certain date, the Bureau will send out employees to visit the home. The Bureau's plan is for these enumerators to use a census application, on a mobile device provided by the Bureau, to capture the information given to them by the in-person interviews.

[14]As mentioned previously, the non-response follow-up operation of the End-to-End Test is being performed in Rhode Island and began in May 2018 and is scheduled to conclude in August 2018.

specifically, in certain cases, the mobile device application did not identify that the enumerator had made a selection on the touch screen until after the enumerator attempted to select it multiple times.

In addition, we previously reported that the delays in system development and testing had reduced the time available to conduct the security reviews and approvals for the systems being used in the 2018 End-to-End Test.[15] Officials in the Bureau's Office of Information Security stated that the original plan was to have at least 6 to 8 weeks to perform security assessments for each system. However, given the compressed time frames, Bureau officials informed us that, in some instances, they have had 5 to 8 days to complete certain assessments. This resulted in systems being deployed before the security of all system components were assessed.[16] We concluded that, going forward, it would be important for these security assessments to be completed in a timely manner and that risks be at an acceptable level before the systems are deployed.

Due in part to IT development and testing schedule challenges that it has identified during the 2018 End-to-End Test, the Bureau is in the process of revising the milestone dates for the additional system development and testing that is to occur after the 2018 End-to-End Test and before the 2020 Census. As noted earlier, the Bureau plans to develop, test, and deploy the 52 systems in the 2020 Census in four operational releases.

According to the Bureau's plans, the agency originally planned to complete development for its first 2020 Census operational release (for recruiting and hiring) in May 2018. However, in June 2018, Bureau officials reported that the Bureau did not meet the May 2018 delivery date for the 2020 Census recruiting and hiring operational release. Additionally, the agency originally planned to complete integration and testing for this operational release by July 2018. However, in July 2018, Bureau officials reported that this milestone had been delayed to August 2018. The Bureau's original milestone dates for the operational releases, reflecting the system development completion status for recruiting and hiring, are shown in table 1.

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[15]GAO-18-543T.

[16]According to the Bureau's Chief Information Security Officer, components that do not have all controls assessed are to be tracked until the assessments are completed, even if it is after the system deploys.

Table 1: The Census Bureau's Original Milestone Dates for Operational Releases for the 2020 Census, as of July 2018

Operational release name	Number of systems in the operational release	Expected completion date for system development	Expected completion date for integration and test	Expected deployment date
1. Recruiting and hiring	21	May 2018 (Not met)	July 2018 (Not met)	September 2018
2. Address canvassing	29	November 2018	March 2019	May 2019
3. Self-response, non-response follow-up, and fraud detection	47	February 2019	June 2019	November 2019
4. Reporting and coverage measurement	25	October 2019	February 2020	July 2020

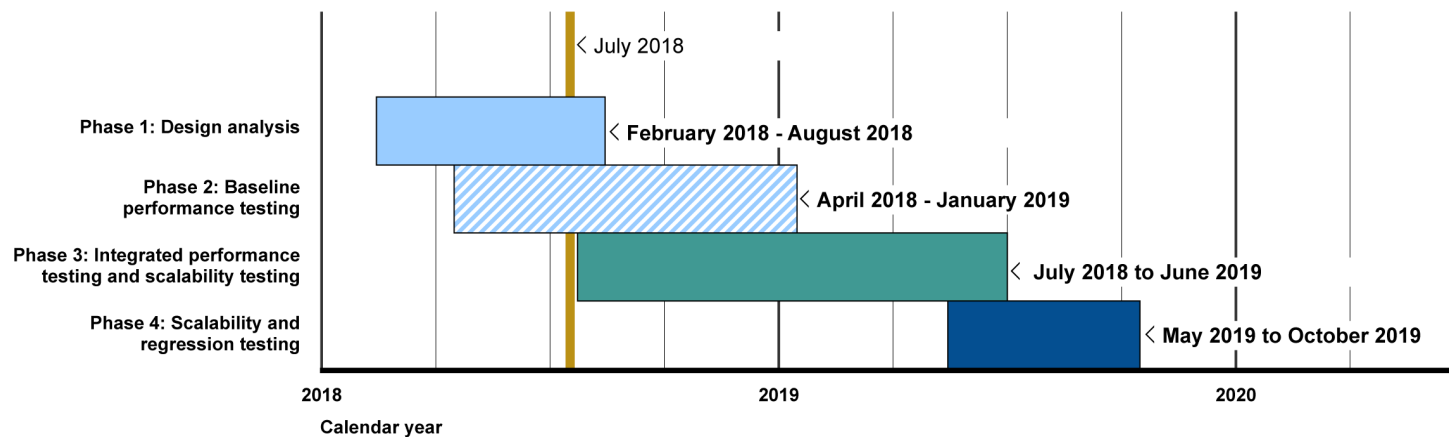Source: GAO analysis of Census Bureau data. | GAO-18-655

Bureau officials reported that they intend to revise the development and testing milestone dates for all four operational releases for the 2020 Census, but that they do not expect the final deployment dates to change. The officials further noted that they are planning to incorporate lessons learned to date from the 2018 End-to-End Test as part of the replanning efforts. However, Bureau officials had not yet identified a specific time frame for completing these efforts.

Managing the schedule for system development and testing is also important because the Bureau plans to conduct system performance and scalability testing after the 2018 End-to-End Test and prior to the 2020 Census.[17] Specifically, in February 2018, the Bureau established an approach to conducting performance and scalability testing that began in February 2018 (with system design reviews and analyses) and is expected to be completed in October 2019.

As of July 2018, the Bureau reported that it had completed design reviews and analysis for 11 systems (such as the operational control system) and had developed performance test plans for 8 systems. Figure 4 summarizes the Bureau's performance and scalability test plans.

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[17]Performance testing is the process of determining how a system behaves under a specific workload (e.g., number of users). Scalability testing is a subset of performance testing to determine a system's effectiveness in handling an increasing number of users.

Figure 4: The Census's Bureau's Expected Performance and Scalability Test Plans for the 2020 Census, as of July 2018

Source: GAO analysis of Census Bureau data. | GAO-18-655

As planning for the 2020 Census continues, it will be important for the Bureau to provide adequate time for system development and testing activities. This will help ensure that the time available for security assessments is not reduced as it has been, thus far, during the 2018 End-to-End Test. We have previously reported that, without adequate time for completing these security assessments, the Bureau will be challenged in ensuring that risks are at an acceptable level before the systems are deployed for the 2020 Census.

Contract management

The Bureau also faces challenges in managing its significant contractor support. The Bureau is relying on contractor support in many areas to prepare for the 2020 Census. For example, it is relying on contractors to develop a number of systems and components of the IT infrastructure. These activities include (1) developing the IT platform (as part of the CEDCaP program) that is intended to be used to collect data from households responding via the Internet and telephone, and for non-response follow-up activities; (2) procuring the mobile devices and cellular service to be used for non-response follow-up; and (3) deploying the IT and telecommunications hardware in the field offices. According to Bureau officials, contractors are also providing support in areas such as fraud detection, cloud computing services, and disaster recovery.

In addition to the development of technology, the Bureau is relying on a technical integration contractor to integrate all of the key systems and infrastructure. The Bureau awarded a contract to integrate the 2020 Census systems and infrastructure in August 2016. The contractor's work

was to include evaluating the systems and infrastructure and acquiring the infrastructure (e.g., cloud or data center) to meet the Bureau's scalability and performance needs. It was also to include integrating all of the systems, supporting technical testing activities, and developing plans for ensuring the continuity of operations. Since the contract was awarded, the Bureau has modified the scope to also include assisting with operational testing activities, conducting performance testing for two Internet self-response systems, and providing technical support for the implementation of the paper data capture system.

However, the Bureau continues to face staffing challenges that could impact its ability to manage and oversee the technical integration contractor. Specifically, the Bureau is managing the integration contractor through a government program management office, but this office is still filling vacancies. In June 2018, Bureau officials reported that 33 of the office's 58 federal employee positions were vacant. This means that the Bureau has only filled 2 of these positions since we originally reported about this risk in October 2017. These vacancies increase the risk that the program management office may not be sufficiently staffed to provide adequate oversight of contractor cost, schedule, and performance.

The development and testing schedule delays during the preparations for the 2018 End-to-End Test raise concerns about the Bureau's ability to effectively perform contractor management. As we reported in November 2016, a greater reliance on contractors for these components of the 2020 Census requires the Bureau to focus on sound management and oversight of the key contracts, projects, and systems.[18]

IT cost growth

The Bureau faces challenges in controlling IT cost growth. Specifically, the Bureau's October 2015 cost estimate included about $3.41 billion in total IT costs for fiscal years 2012 through 2023. These included costs for, among other things, system engineering, test and evaluation, and infrastructure, as well as for a portion of the CEDCaP program.[19] However, in October 2017, we reported[20] that IT costs would likely be at

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[18]GAO, *Information Technology: Uncertainty Remains about the Bureau's Readiness for a Key Decennial Census Test,* GAO-17-221T (Washington, D.C.: Nov. 16, 2016).

[19]The 2020 Census program pays for the portion of costs for the CEDCaP program that relate to 2020 Census operations. According to the October 2015 estimate, the portion of CEDCaP costs associated with the 2020 Census was estimated at $328 million of the $548 million total program estimate.

[20]GAO-18-215T.

least $4.8 billion, due to increases in costs associated with the CEDCaP program[21] and certain IT contracts (including those associated with technical integration and mobile devices).

In December 2017, the Bureau reported that its estimated IT costs had grown from $3.41 billion to $4.97 billion—an increase of $1.56 billion. Figure 5 identifies the Bureau's estimate of total IT costs associated with the 2020 program as of December 2017.

Figure 5: Total Information Technology Costs Estimated by the Census Bureau, as of December 2017
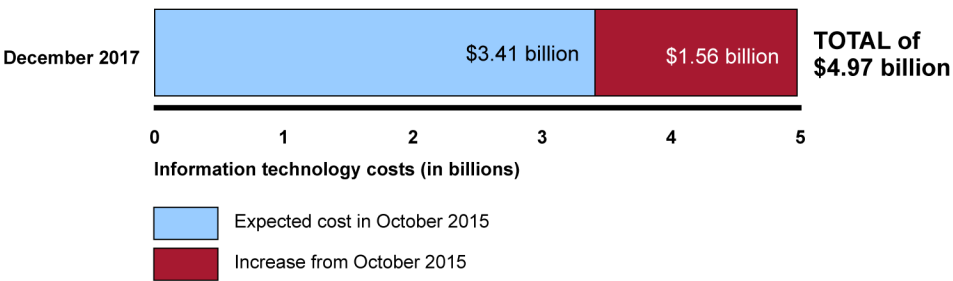
Source: GAO analysis of Census Bureau data. | GAO-18-655

The cost increases were due, in large part, to the Bureau (1) updating the cost estimate for the CEDCaP program, (2) including an estimate for technical integration services, and (3) updating costs related to other major contracts (such as mobile device as a service).[22] Table 2 describes the IT costs that comprised the Bureau's cost estimate as of December 2017.

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[21]In May 2017, the Bureau reported that the CEDCaP program's cost estimate was increasing by about $400 million—from its original estimate of $548 million in 2013 to a revised estimate of $965 million in May 2017.

[22]As part of mobile device as a service, the Bureau plans to provide mobile devices (including mobile phones, tablets, and laptops) and cellular service to field staff to support operations such as address canvassing and non-response follow-up.

Table 2: Total 2020 Census Information Technology (IT) Costs Estimated by the Census Bureau, by Cost Category, as of December 2017

Dollars in millions

IT cost category	Expected cost
Technical integration services	$1,492
Census questionnaire assistance	$817
Other IT services, such as day-to-day IT support	$808
Census Enterprise Data Collection and Processing (CEDCaP) costs related to the 2020 Census	$509[a]
Decennial device as a service	$489
Field IT deployment	$450
Other non-CEDCaP systems, such as recruitment and personnel systems	$401
Total	**$4,966**

Source: GAO analysis of Census Bureau data. | GAO-18-655

[a]The 2020 program pays for a portion of the costs for the CEDCaP program. As of May 2017, the Census Bureau estimated that the entire cost of the CEDCaP program would be about $965 million.

IT cost information that is accurately reported and clearly communicated is necessary to help ensure that Congress and the public have confidence that taxpayer funds are being spent in an appropriate manner. However, the amount of cost growth since the October 2015 estimate raises questions as to whether the Bureau has a complete understanding of the IT costs associated with the 2020 program. We have ongoing work reviewing the extent to which the Bureau's December 2017 cost estimate is reliable.

Governance and internal coordination

Effective governance can drive change, provide oversight, and ensure accountability for results. Further, effective IT governance was envisioned in the statutory provisions enacted in 2014 and referred to as the Federal Information Technology Acquisition Reform Act (FITARA),[23] which strengthened and reinforced the role of the departmental CIO. The component CIO (such as the Bureau's CIO) also plays a role in effective IT governance, as the component is subject to the oversight and policies of the parent department implementing FITARA.

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[23]Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for Fiscal Year 2015, Pub. L. No. 113-291, div. A, title VIII, subtitle D, 128 Stat. 3292, 3438-50 (Dec. 19, 2014).

Our work has noted that officials in Commerce's Office of the Secretary have increased their oversight of the Bureau's preparations for the 2020 Census by holding regular meetings to discuss contracts, expected costs, and risks, among other topics.[24] For example, Bureau officials in the Decennial Directorate told us that they have recently begun meeting with the Secretary of Commerce on a monthly basis, and with the Under Secretary of Commerce for Economic Affairs on a weekly basis, to discuss 2020 Census issues. Moreover, the department's Acting CIO has also been involved in overseeing the Bureau's IT system readiness.

The Bureau has also appointed two new assistant directors within the Decennial Directorate. Each of these individuals is responsible for overseeing aspects of the 2020 Census program, to include schedules, contracts, and system development. In addition, Bureau officials told us that the CIO (or a designated representative) is to be a member of the governance boards that oversee all of the operations and technology for the 2020 Census, in order to ensure executive-level oversight of the key systems and technology.

Nevertheless, in August 2016, we reported on challenges that the Bureau has had with IT governance and internal coordination, including weaknesses in its ability to monitor and control IT project costs, schedules, and performance.[25] We made eight recommendations to the Secretary of Commerce to direct the Bureau to, among other things, better ensure that risks are adequately identified and schedules are aligned. The department agreed with our recommendations. As of June 2018, the Bureau had fully implemented five of the recommendations and had taken initial steps toward implementing the other three recommendations.

Given the schedule delays and cost increases previously mentioned, and the vast amount of development, testing, and security assessments left to be completed, we remain concerned about executive-level oversight of systems and security. Moving forward, it will be important that the CIO and other Bureau executives continue to use a collaborative governance approach to effectively manage risks and ensure that the IT solutions meet the needs of the agency within cost and schedule.

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[24] GAO-18-543T.

[25] GAO-16-623.

Cybersecurity

In November 2016, we described the significant challenges that the Bureau faced in securing systems and data for the 2020 Census, and we noted that tight time frames could exacerbate these challenges.[26] Two such challenges were (1) ensuring that individuals gain only limited and appropriate access to the 2020 Census data, including personally identifiable information (PII), such as name, personal address, and date of birth; and (2) making certain that security assessments were completed in a timely manner and that risks were at an acceptable level.[27] Protecting PII, for example, is especially important because a majority of the 44 systems to be used in the 2018 End-to-End Test contain such information, as reflected in figure 6.[28]

Figure 6: Personally Identifiable Information (PII) in Census Bureau Systems Included in the 2018 End-to-End Test, as of June 2018

System contains PII
38 systems, about 86%

System does not contain PII
6 systems, about 14%
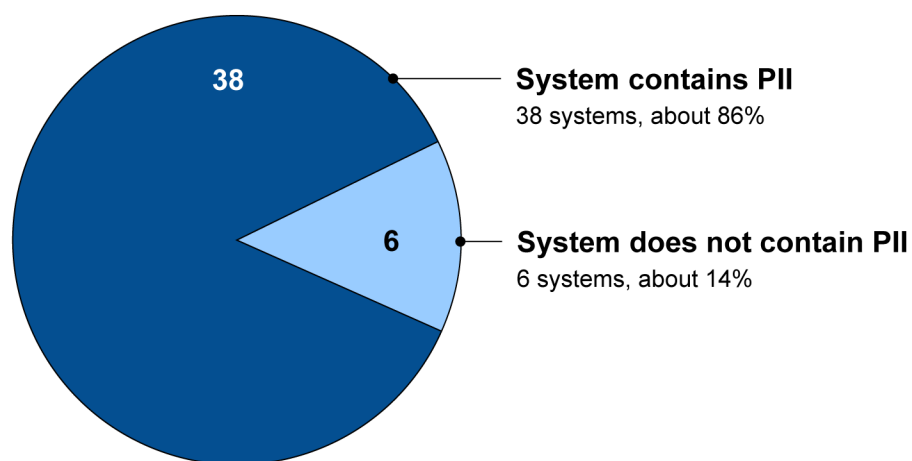
Source: GAO analysis of Census Bureau data. | GAO-18-655

To address these and other challenges, federal law specifies requirements for protecting federal information and information systems,

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[26]GAO-17-584T.

[27]GAO-17-221T.

[28]According to officials in the Bureau's Office of Information Security, 26 systems contain data that is protected from disclosure under Title 13 of the U.S. Code. This law protects information provided by the public for the Bureau's censuses and surveys and requires that the Bureau keep it confidential. 13 U.S.C. § 9. The Bureau may not disclose or publish any private information that identifies an individual or business, such as names, addresses, Social Security numbers, and telephone numbers.

such as those systems to be used in the 2020 Census. Specifically, the Federal Information Security Management Act of 2002 and the Federal Information Security Modernization Act of 2014 (FISMA) require executive branch agencies to develop, document, and implement an agency-wide program to provide security for the information and information systems that support operations and assets of the agency.[29]

Accordingly, the National Institute of Standards and Technology (NIST) developed risk management framework guidance for agencies to follow in developing information security programs.[30] In addition, the Office of Management and Budget's (OMB) revised Circular A-130 on managing federal information resources required agencies to implement the NIST risk management framework to integrate information security and risk management activities into the system development life cycle.[31]

In accordance with FISMA, NIST guidance, and OMB guidance, the Bureau's Office of the CIO established a risk management framework. This framework requires system developers to ensure that each of the Bureau's systems undergoes a full security assessment, and that system developers remediate critical deficiencies. In addition, according to the framework, system developers are to ensure that each component of a system has its own system security plan that documents how the Bureau intends to implement security controls. As a result of this requirement, system developers for a single system might develop multiple system security plans which all have to be approved as part of the system's complete security documentation.

According to the Bureau's framework, each of the 44 systems in the 2018 End-to-End Test will need to have complete security documentation (such as system security plans) and an approved authorization to operate prior

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[29]The Federal Information Security Modernization Act of 2014, Pub. L. No. 113-283, 128 Stat. 3073 (Dec. 18, 2014) largely superseded the Federal Information Security Management Act of 2002, enacted as Title III, E-Government Act of 2002, Pub. L. No. 107-347, 116 Stat. 2899, 2946 (Dec. 17, 2002).

[30]NIST, *Guide for Applying the Risk Management Framework to Federal Information Systems: A Security Life Cycle Approach*, SP 800-37, Revision 1 (Gaithersburg, Md.: February 2010).

[31]OMB, *Revision of OMB Circular A-130, Managing Federal Information as a Strategic Resource* (Washington, D.C.: July 28, 2016).

to its use in the 2018 End-to-End Test.[32] In May 2018, Bureau officials reported that they had recently updated their policies related to obtaining an authorization to operate. Specifically, once a system undergoes a security assessment and receives an authorization, the system moves into continuous monitoring.[33] According to the Bureau's Chief Information Security Officer, authorized systems do not need a formal reauthorization unless the risk posture of the system changes; this could occur, for example, if the system undergoes significant new development.

As of June 2018, most of the systems in the 2018 End-to-End Test had received an authority to operate. Specifically, according to the Bureau:

- Thirty-three of the 44 systems in the test had obtained an authorization to operate and were under continuous monitoring.

- Eight systems had obtained an authorization, but will need to be reauthorized due to additional significant planned development or changes to the infrastructure environment (e.g., from a data center to a cloud-based environment).

- Three systems do not yet have an authorization to operate for the 2018 End-to-End Test.

Figure 7 summarizes the authorization to operate status for the systems being used in the 2018 End-to-End Test, as reported by the Bureau.

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[32]According to the Bureau's framework, systems are to obtain security authorization approval from the authorizing official in order to operate. Specifically, the authorizing official evaluates the security authorization package and provides system authorization if the overall risk level is acceptable. In addition, according to the Bureau's IT security program policy, the issuance of an authorization to operate for a system requires support of both the technical authorizing official (i.e., the CIO) and the business authorizing official responsible for funding and managing the system (i.e., the Associate Director for Decennial Census Programs).

[33]According to the Bureau's risk management framework, once a system obtains an authorization, it is transitioned to the continuous monitoring process where the authorizing official can provide ongoing authorization for system operation as long as the risk level remains acceptable.

Figure 7: Authorization to Operate Status for the 44 Systems Being Used in the Census Bureau's 2018 End-to-End Test, as of June 2018

Number of systems
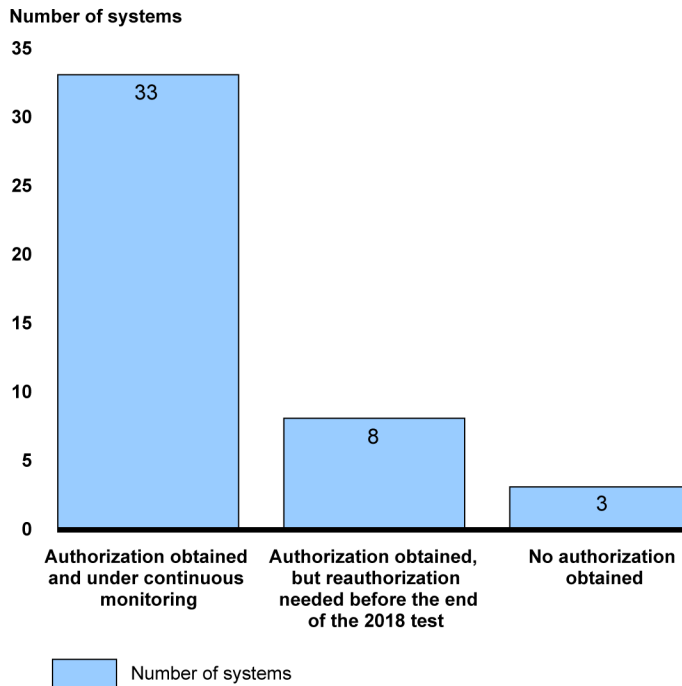
Source: GAO analysis of Census Bureau data. | GAO-18-655

According to the Bureau's framework, security assessment findings that need to be remediated are tracked in a plan of action and milestones (POA&M). Specifically, the POA&M provides a description of the vulnerability identified in the security assessment as a result of a control weakness. As of June 2018, the Bureau had nearly 3,100 open POA&Ms to remediate issues identified during security assessments performed for the 2018 End-to-End Test. Of these nearly 3,100 POA&Ms, 43 were considered "very high risk" or "high risk" weaknesses. Further, over 2,700 of the POA&Ms were related to the infrastructure components being developed by the technical integration contractor. Officials from the Bureau and the technical integration contractor reported that they are currently working to address these POA&Ms.

Further, because several of the systems that will be a part of the 2018 End-to-End Test and the 2020 Census are not yet fully developed, the Bureau has not finalized all of the security controls to be implemented; assessed those controls; developed plans to remediate control

weaknesses; and determined whether there is time to fully remediate any deficiencies before the systems are needed for the test. Also, as discussed earlier, the Bureau is facing system development and testing challenges that are delaying the completion of milestones and compressing the time available for security testing activities.

In addition, while the large-scale technological changes (such as Internet self-response) increase the likelihood of efficiency and effectiveness gains, they also introduce many cybersecurity challenges. The 2020 Census also involves collecting PII on over a hundred million households across the country, which further increases the need to properly secure these systems. Thus, it will be important that the Bureau provides adequate time to perform these security assessments, completes them in a timely manner, and ensures that risks are at an acceptable level before the systems are deployed.

Moving forward, the Bureau's continued attention to addressing the challenges and risks that we have identified in its efforts to manage the schedules, contracts, costs, governance and internal coordination, and cybersecurity of its IT is critical. Over the past decade, we have made 93 recommendations specific to the 2020 Census to help address, among other things, the Bureau's implementation and management of IT, scheduling, and cost estimation. The Bureau has generally agreed with those recommendations and has taken action to address 61 of them. However, as of July 2018, the remaining 32 recommendations had not been fully implemented, although the Bureau had taken initial steps— including developing action plans—to address them. Continued management attention to fully implementing these recommendations is essential for a cost-effective and secure enumeration.

Agency Comments and Our Evaluation

Commerce provided written comments on a draft of this report. In its comments, reprinted in appendix II, Commerce stated that it did not have any substantive disagreements with the findings in the report. The department further stated that, while it had made progress over the past year as a result of increased management focus in the areas of cost estimation, scheduling, IT security, contract management, and governance, much work remains to prepare and implement the IT systems for the 2020 Census. Commerce also provided technical comments, which we addressed, as appropriate.

We are sending copies of this report to the Secretary of Commerce, the Acting Director of the U.S. Census Bureau, and interested congressional committees. In addition, the report will be available at no charge on the GAO website at http://www.gao.gov.

If you or your staffs have any questions about this report, please contact Nick Marinos at (202) 512-9342 or marinosn@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Nick Marinos
Director, Cybersecurity and Data Protection Issues

List of Requesters

The Honorable Ron Johnson
Chairman
The Honorable Claire McCaskill
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Gary Peters
Ranking Member
Subcommittee on Federal Spending Oversight and Emergency
Management
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Trey Gowdy
Chairman
The Honorable Elijah E. Cummings
Ranking Member
Committee on Oversight and Government Reform
House of Representatives

The Honorable Mark Meadows
Chairman
The Honorable Gerald E. Connolly
Ranking Member
Subcommittee on Government Operations
Committee on Oversight and Government Reform
House of Representatives

The Honorable Will Hurd
Chairman
The Honorable Robin L. Kelly
Ranking Member
Subcommittee on Information Technology
Committee on Oversight and Government Reform
House of Representatives

The Honorable Thomas R. Carper
United States Senate

Appendix I: Status of Development and Testing for Systems in the 2018 End-to-End Test, as of June 2018

As part of the 2018 End-to-End Test, the Census Bureau (Bureau) plans to incrementally test, deploy, and use the 44 systems from December 2016 through the end of the test in April 2019. These operations include address canvassing, self-response (i.e., Internet, phone, or paper), field enumeration, and tabulation and dissemination. According to the Bureau, a single system may be deployed multiple times throughout the test (with additional or new functionality) if that system is needed for more than one of these operations.

Table 3 describes the status of development and testing, and describes if a portion of functionality has been deployed for each system in the 2018 End-to-End Test. The table also describes key system deployment dates and the delay in these dates since August 2017.

Table 3: Development, Testing, and Deployment Status for the 44 Systems in the Census Bureau's 2018 End-to-End Test, as of June 2018

System name and description	Status of development	Status of testing	Expected/ actual first deployment date[a] (delay since August 2017)	Expected/ actual final deployment date[a] (delay since August 2017)	Has at least a portion of the system's functionality been deployed?
1. **Block Assessment, Review and Classification Application** Interactive review tool that is designed to assist an analyst in assessing a set of geographic work units.	Complete	Complete	December 2016	n/a	Yes
2. **OneForm Designer Plus** Tool that creates paper forms including decennial questionnaires, letters, envelopes, notices of visit, language guides, and other Decennial field and public materials.	Complete	Complete	March 2017	n/a	Yes
3. **Census Document System** Web-based system for requesting forms design services, publications and graphics services, and printing services.	Complete	Complete	March 2017	September 2017	Yes
4. **MOJO Recruiting Dashboard** System that provides a dashboard to show recruiting metrics.	Complete	Complete	March 2017	June 2018	Yes

Appendix I: Status of Development and Testing
for Systems in the 2018 End-to-End Test, as of
June 2018

System name and description	Status of development	Status of testing	Expected/ actual first deployment date[a] (delay since August 2017)	Expected/ actual final deployment date[a] (delay since August 2017)	Has at least a portion of the system's functionality been deployed?
5. **Listing and Mapping Application** Single instrument that enables field users to capture and provide accurate listing and mapping updates to the Master Address File/Topologically Integrated Geographic Encoding and Referencing Database.	Complete	Complete	July 2017	April 2018 (1-month delay)	Yes
6. **Mobile Case Management** Tool that provides mobile device-level survey case management and dashboards, and manages data transmissions and other applications on the mobile device.	Complete	Complete	July 2017	April 2018 (1-month delay)	Yes
7. **MOJO Optimizer/Modeling** Service to optimize the field workers' routes.	Complete	Complete	August 2017	April 2018 (1-month delay)	Yes
8. **Integrated Logistics Management System** System to manage logistics and resource planning.	Complete	Complete	August 2017	July 2018	Yes
9. **Matching and Coding Software** System that allows for clerical matching and geocoding during Non-ID Processing.	Complete	Complete	February 2018	n/a	Yes
10. **Real Time Non-ID Processing** System that matches addresses in real-time, geocodes addresses in real-time, and geo-locates housing units using web map services.	Complete	Complete	February 2018	n/a	Yes
11. **Concurrent Analysis and Estimation System** System that stores data and uses it to execute statistical models in support of survey flow processing, analysis, and control.	Complete	Complete	March 2018	n/a	Yes
12. **Enterprise Censuses and Surveys Enabling (ECaSE) – Internet Self-Response (ISR)** Tool that supports self-response data collection via the Internet for respondents and by call center agents on behalf of respondents.	Complete	Complete	March 2018 (1-month delay)	n/a	Yes

System name and description	Status of development	Status of testing	Expected/ actual first deployment date[a] (delay since August 2017)	Expected/ actual final deployment date[a] (delay since August 2017)	Has at least a portion of the system's functionality been deployed?
13. **Census Questionnaire Assistance** Provides call center capability for self-response and assists respondents with responding to and completing census questionnaires.	Complete	Complete	March 2018 (1-month delay)	April 2018 (1-month delay)	Yes
14. **Census Hiring and Employment Check** Administrative system that automates the clearance processing of all personnel at Census Bureau Headquarters, the Bureau of Economic Analysis, the Regional Offices, the National Processing Center, and two Computer-Assisted Telephone Interview sites.	Complete	Complete	March 2017	June 2018 (4-month delay)[b]	Yes
15. **Decennial Physical Access System** System that is used to generate badges for certain employees, including enumerators, listers, and Census Field Supervisors.	Complete	Complete	March 2018	June 2018	Yes
16. **Census Human Resources Information System** Web-based personal information tool providing personnel and payroll information on desktops.	Complete	Complete	March 2017	July 2018	Yes
17. **Commerce Business System** System that collects and reports labor hours and costs for the activities that the National Processing Center performs.	Complete	Complete	March 2017	July 2018	Yes
18. **Decennial Service Center** Suite of systems to handle all IT service requests initiated by field staff.	Complete	Complete	March 2017	July 2018	Yes
19. **Desktop Services** Suite of systems that includes chat.	Complete	Complete	March 2017	July 2018	Yes
20. **2020 Website** Website for the 2018 End-to-End Test.	Complete	Complete	June 2018	January 2019	Yes

**Appendix I: Status of Development and Testing
for Systems in the 2018 End-to-End Test, as of
June 2018**

System name and description	Status of development	Status of testing	Expected/ actual first deployment date[a] (delay since August 2017)	Expected/ actual final deployment date[a] (delay since August 2017)	Has at least a portion of the system's functionality been deployed?
21. **Unified Tracking System** Data warehouse that is to combine data from a variety of Census systems, bringing the data to one place where the users can run or create reports to analyze survey and resource performance.	Complete	In progress	December 2016	July 2018	Yes
22. **Master Address File/Topologically Integrated Geographic Encoding and Referencing System** Database that contains, manages, and controls a repository of spatial and non-spatial data used to provide extracts to define census operations, provide maps, and support Web applications.	Complete	In progress	December 2016	October 2018	Yes
23. **Automated Tracking and Control** Tool that provides customer, employee, and workflow management by automating business and support activities. It provides outbound call tracking for Geographic Partnership Programs and material tracking and check-in.	Complete	In progress	February 2018	July 2018	Yes
24. **Intelligent Postal Tracking Service** Mail tracking system developed by the Census Bureau and the U.S. Postal Service to trace individual mail pieces during transit.	Complete	In progress	February 2018	July 2018	Yes
25. **Decennial Applicant, Personnel and Payroll Systems** System that supports personnel and payroll administration for temporary, intermittent Census Bureau employees participating in the 2018 End-to-End Test.	Complete	In progress	March 2017	July 2018 (11-month delay)[b]	Yes
26. **Recruiting and Assessment** Tool that provides capabilities for applicant recruiting and the applicant pre-selection assessment process.	Complete	In progress	March 2017	July 2018 (5-month delay)[b]	Yes

Appendix I: Status of Development and Testing
for Systems in the 2018 End-to-End Test, as of
June 2018

System name and description	Status of development	Status of testing	Expected/ actual first deployment date[a] (delay since August 2017)	Expected/ actual final deployment date[a] (delay since August 2017)	Has at least a portion of the system's functionality been deployed?
27. **Identity Management System** System used to ensure that the right individuals have access to the right resources at the right times for the right reasons.	Complete	In progress	March 2017	January 2019	Yes
28. **ECaSE – Field Operational Control System** System that manages field assignments, reviews and approves field worker's time and expense, and tracks field worker's performance.	Complete	In progress	July 2017	July 2018 (4-month delay)[b]	Yes
29. **Geospatial Services** Tool that provides vintage imagery service, internal current imagery service, public current imagery service, and mapping services.	Complete	In progress	July 2017	July 2018	Yes
30. **Service Oriented Architecture** Enterprise software architecture model used for designing and implementing communication between mutually interacting software applications in a service-oriented architecture.	Complete	In progress	July 2017	January 2019 (6-month delay)	Yes
31. **ECaSE Operational Control System** System that manages the data collection universe for all enumeration operations, maintains operational workloads, and provides alerts to management.	Complete	In progress	August 2017	July 2018 (4-month delay)[b]	Yes
32. **National Processing Center Printing** Service that provides printing services for low-volume forms and merges static form and variable data, such as printing a standard form with unique addresses.	Complete	In progress	August 2017	July 2018	Yes
33. **ECaSE – Enumeration** Tool that captures survey responses collected by door-to-door enumeration, records contact attempts, and collects employee availability and time and expenses.	Complete	In progress	March 2018 (1-month delay)	July 2018 (4-month delay)[b]	Yes

Appendix I: Status of Development and Testing
for Systems in the 2018 End-to-End Test, as of
June 2018

System name and description	Status of development	Status of testing	Expected/ actual first deployment date[a] (delay since August 2017)	Expected/ actual final deployment date[a] (delay since August 2017)	Has at least a portion of the system's functionality been deployed?
34. **Integrated Computer Assisted Data Entry** Tool that captures paper responses from questionnaires.	Complete	In progress	March 2018 (1-month delay)	July 2018	Yes
35. **Census Image Retrieval Application** Application that provides secure access to census data and digital images of the questionnaires from which the data were captured.	Complete	In progress	March 2018 (1-month delay)	January 2019 (11-month delay)[b]	Yes
36. **Centurion** Tool that provides an external interface for the upload of group quarters electronic response data.	Complete	In progress	July 2018 (4-month delay)	n/a	No
37. **Sampling, Matching, Reviewing, and Coding System** System that is to support quality control for field operations.	In progress	In progress	August 2017	October 2018 (7-month delay)[b]	Yes
38. **Control and Response Data System** System that is to provide a sample design and universe determination for the Decennial Census.	In progress	In progress	February 2018	January 2019 (3-month delay)	Yes
39. **Census Data Lake** Repository for response data that is to provide data access to reporting and analytics applications.	In progress	In progress	March 2018 (1-month delay)	January 2019	Yes
40. **Decennial Response Processing System** System that is to perform data processing on the raw response data and stores the final processed response data for long-term storage.	In progress	In progress	March 2018 (1-month delay)	January 2019	Yes
41. **Production Environment for Administrative Records Staging, Integration and Storage** Tool that is to manage Administrative Records and provides services associated with those records.	In progress	In progress	March 2018 (1-month delay)	January 2019 (10-month delay)[b]	Yes

System name and description	Status of development	Status of testing	Expected/ actual first deployment date[a] (delay since August 2017)	Expected/ actual final deployment date[a] (delay since August 2017)	Has at least a portion of the system's functionality been deployed?
42. **Fraud Detection System** System that is to identify fraudulent responses either in real-time or post data collection.	In progress	In progress	October 2018 (8-month delay)	n/a	No
43. **Center for Enterprise Dissemination Services and Consumer Innovation** Tool that will provide search and access to tabulated Census data.	In progress	In progress	January 2019	n/a	No
44. **Tabulation** Tool that is to receive post-processed response data and produces tabulated statistical data.	In progress	In progress	January 2019	n/a	No

Legend:

n/a = not applicable. These systems are only being deployed one time, so the first deployment date also represents the final deployment date.

Source: GAO analysis of Census Bureau data. | GAO-18-655

[a]The dates listed for June 2018 or earlier should be considered actual dates.

[b]According to officials within the Bureau's 2020 Census Systems Engineering and Integration office, the delay in the final deployment date for this system is due to a change in the timing of the operations it is supporting for the 2018 End-to-End Test.

Appendix II: Comments from the Department of Commerce

UNITED STATES DEPARTMENT OF COMMERCE
The Secretary of Commerce
Washington, D.C. 20230

August 17, 2018

Mr. David Powner
Director
Information Technology Management Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Powner:

The U.S. Department of Commerce appreciates the opportunity to comment on the U.S. Government Accountability Office's (GAO) draft report, *"2020 Census: Continued Management Attention Needed to Address Challenges and Risks with Developing, Testing, and Securing IT Systems"* (GAO-18-655). We have no substantive disagreements with the findings in this report.

While we agree that much work remains to prepare and implement our information technology (IT) systems for the 2020 Census, we appreciate GAO's recognition of the substantial progress we have made over the past year as a result of increased management focus in the areas of cost estimation, scheduling, IT security, contract management, and governance. These include:

- An extensive and independent review at the Secretary's request of the lifecycle cost estimate for the entire 2020 Census, including all key assumptions, methods, and risk analyses for both IT and non-IT operations.

- Executing a detailed schedule development effort from July – December 2017 with the baselining of the schedule on December 14, 2017. The baselining has been followed by weekly statusing and monitoring of the schedule. Currently, we are working with Operations, Systems, and Testing Project Managers to incorporate the converted systems releases into the baselined Integrated Master Schedule by October 31, 2018.

- We completed security authorizations for all 43 systems currently operational and in use for the 2018 Census Test. The 44th and final system to be used in the 2018 Census Test is scheduled for authorization prior to its scheduled use in October of this year.

- We are continuously working with the Federal intelligence community and private-sector companies to strengthen our cybersecurity posture and to improve our incident response capabilities. We have implemented all Federal requirements and industry best practices, including use of both Federal and private-sector third parties to test our cyber defenses.

Mr. David Powner
Page 2

- Over the past year, we have increased our contract oversight and monitoring efforts with the addition of a weekly meeting where Decennial senior leadership meets to review contract performance status. Contract performance issues presented at this leadership status meeting are addressed to reduce risk to 2020 operations. In addition, we implemented monthly reporting on the 2020 Major Contracts using an EVM or EVM-like processes to track performance against cost and schedule, which are presented during a monthly status meeting with Secretary Ross.

- Revising 2020 Census governance to operationalize the processes as we transition from Research & Testing to Peak Operations. The revised approach provides clear decision escalation, reduces meeting burden, and improves communication of decisions to all stakeholders.

We have also enclosed our technical comments on this draft report.

Sincerely,

Wilbur Ross

Enclosure

Appendix III: GAO Contacts and Staff Acknowledgments

GAO Contacts

Nick Marinos at (202) 512-9342 or marinosn@gao.gov

Staff Acknowledgments

In addition to the contacts named above, the following staff made key contributions to this report: David Powner (Director); Jon Ticehurst (Assistant Director); Kate Sharkey (Analyst in Charge); Chris Businsky; Rebecca Eyler; Torrey Hardee; Thomas Johnson; Hoyt Lacy; Scott Pettis; Daniel Spence; Andrea Starosciak; and Umesh Thakkar.