

2020 CENSUS: OUTCOMES OF THE 2016 SITE TESTS

HEARING

BEFORE THE
SUBCOMMITTEE ON
GOVERNMENT OPERATIONS
OF THE
COMMITTEE ON OVERSIGHT
AND GOVERNMENT REFORM
HOUSE OF REPRESENTATIVES
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2020 CENSUS: OUTCOMES OF THE 2016 SITE TESTS

Wednesday, November 16, 2016

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON GOVERNMENT OPERATIONS,
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM,
Washington, D.C.

The subcommittee met, pursuant to call, at 10:11 a.m., in Room 2247, Rayburn House Office Building, Hon. Mark Meadows [chairman of the subcommittee] presiding.

Present: Representatives Meadows, Buck, Carter, Grothman, Connolly, Maloney, and Norton.

Mr. MEADOWS. The Subcommittee on Government Operations will come to order. And, without objection, the chair is authorized to declare a recess at any time.

Before I go into my opening statement, Director Thompson, I want to just say thank you to you and your team who not only made a special effort to come to my district with regards to some of the onsite testing. It was very illuminating. And I just want to say thank you for making the special effort to help me understand that process. So kudos to you and your staff in a very busy time for making the time to help us be better informed.

The 2020 Census will be unlike any others in 2020-plus years since the first census happened in 1790, and for the first time the Census Bureau will be using technology ranging from mobile devices to Internet self-response to carry out one of the most important tasks for the Federal Government, counting the people of this great Nation. The use of this new technology and modernization has the potential to create tremendous cost savings for the American taxpayer.

Along with this great promise, however, the Bureau's effort also can carry significant risk. For example, if the testing and delivery schedules are not met or is strictly adhered to, instead of the cost savings, there could be cost overruns. We've seen that in previous censuses, so this is not our first rodeo as we look at this.

In prior hearings, and actually in prior meetings that we've had, the committee has identified a number of areas where the Bureau is at risk of cost and schedule overruns, perhaps incomplete census data, and information security breaches or the potential for that.

The time is running out to address those. I think we all realize that we're on a critical time mission. And, again, I want to acknowledge the fact that as we have come together, seen those issues, it is critically important that we keep all hands on deck.

I believe that even though we may have a difference of opinions in terms of the severity of the challenges that face us, that we're committed to do that. And I want to acknowledge that the last meeting that we had here, which was not a public hearing where many of you here, we had frank discussions and concerns, and yet at the same time, I think we're able to go apart to say that we're committed to making this thing happen. And I'm optimistic that we will be able to do that.

But only by correcting some of the issues that we have will we be able to make sure that the new administration and the 2020 Census will be placed in a scenario for success. Decisions that we're making now, quite frankly, will have an impact for the next 4 years. And so it is critically important that we make good decisions as we start to implement a number of these areas.

I have some serious concerns, as Director Thompson knows, with the Bureau's contracting schedule for the 2020 systems, as well as their commitment to making those 2020 commitments the highest priority for those programs.

The Bureau's modernization effort entails a design, building, delivery, and implementation system of some 52 different systems. Any time that you have that many moving parts, it can be troubling. Each of these systems should be field tested in their final form before being rolled out in the 2020 Census.

Today, obviously, we'll hear from the GAO that with 8 months left before the final testing, half of those 50 systems to be tested in 2018 will either be delivered after the start of the testing or, worse yet, their delivery date is still unknown. The fact that there is even a suggestion that IT products will go untested is unacceptable, and no system or product, not a single one, can be allowed to be used to collect and process the American public's sensitive personal information without first being tested.

Despite the need to test more than 50 systems, the Bureau recently announced the cancellation of the 2017 field testing operations. And so I look forward to hearing on how we can maybe combine some of those as we start to address some of the issues, whether it be testing in a different mode, or how we make sure that there is that integrity.

The Bureau has claimed that budgetary constraints are preventing them from this testing; however, when I start to look at some of the numbers, I guess my concern is that it seems like the Bureau has opted on its own to kind of reduce the 2020 budget by more than \$120 million, which would have an impact now. And so I would like to get some greater clarity on why that decision was made, what we need to do there.

No other program in the Bureau's portfolio is being cut anywhere near that amount. And so I guess, to give you an example, the American Community Survey, which is probably the single thing we get the most complaints about as it relates to the census because of the nature of the questions, that program is only being reduced by a mere \$3 million.

So I want to see where our priorities are as we start to look at it, Director. The 2020 program should be the highest priority program. It should not be shouldering roughly 75 percent of any anticipated budget reductions.

I'd like to thank all of the witnesses for being here today. I believe that we will be able to make some real progress.

And with that, I'll recognize the ranking member, my good friend, Gerry Connolly. And congratulations on your reelection. You did that in spite the fact that I endorsed you.

Mr. CONNOLLY. We have a mutual pact. If it helps him, I'll campaign against him or for him back home, and he's offered to do the same for me.

That you, Mr. Meadows, and congratulations to you as well.

I think this is an important hearing to examine the Census Bureau's 2016 test for the all-important 2020 Decennial Census. The decennial census is a cornerstone of our constitutional system. It is used to apportion seats here in the House, to define State legislative districts, and determine school district assignments.

Census data helps the private sector make sound investments by identifying unsaturated or emerging growth markets and developing business plans and loan applications. The data also helps Congress make decisions in how to fund special education grants, for example, or provide adoption assistance, or create small business development centers, rural business enterprise grants, and other programs. Very important to the U.S. economy and its growth.

The 2020 Decennial Census will be the first to embrace information-collection technology on a broad scale. According to the Bureau's calculations, the Bureau's information technology plans will make this census leaner and result in \$5.2 billion in savings compared to the last census.

But those savings can only be effectuated if the Bureau's plans are fully implemented and operate without interruption, and if the Bureau is able to accomplish its constitutional mandate and accurately count all residents.

The Government Accountability Office—I'm glad to see Mr. Powner here again, thank you—is advising Congress that it has concerns. They tell us that 25 percent of the households in a recent field test could not be contacted by Bureau enumerators even after six attempts. For example, large multi-unit buildings and locked or gated communities were problematic, as one might imagine, as enumerators were unable to enter the property.

The Bureau's software also made it difficult for enumerators to leave notes, which would help indicate what time of day a dwelling's resident was likely to be present or not. The Bureau also had difficulty in creating enumerated canvas lists from administrative data, and enumerators had training difficulties which resulted in diminished performance.

Our goal in this hearing is to ensure that the Bureau answers the concerns of the GAO and learns the lessons from its fields tests and shares them with us and fixes problems in advance of the census itself.

This subcommittee has a role to play in a successful census, and we're committed to a successful census on a bipartisan basis. We must ensure the Bureau continues to make progress in the next 3 years, improve its policies, procedures, and technology based on information gained in those field tests, and test and retest those improvements before the 2020 Census.

In October, I joined Chairman Chaffetz and Ranking Member Cummings and Chairman Meadows of this subcommittee in inquiring on the status of the critical IT decisions related to the 2020 Census that had yet to be made and the Bureau's overall preparedness for the census. We were pleased to receive a quick response and will continue to work with the Bureau to ensure that the CEDCaP initiative stays on schedule.

The Bureau has been making progress. It recently hired a new chief information officer, Mr. Kevin Smith, who is with us today. The presence of Mr. Smith in an office that has been without a permanent leader for nearly a year is, finally, a welcome sign. While he has only been in the position for a few months, I look forward to hearing the steps he's taken to improve the Bureau's IT infrastructure and how he proposes to implement FITARA, also known as Connolly-Issa.

Mr. MEADOWS. I agree.

Mr. CONNOLLY. Again, I want to thank you, Chairman Meadows, for calling this hearing and keeping us focused on the importance of this subject matter.

With that, I yield back.

Mr. MEADOWS. I thank the gentleman.

And I will hold the record open for 5 legislative days for any member who would like to submit a written statement.

We'll now recognize our panel of witnesses. I'm pleased to welcome the Honorable John Thompson, director of the U.S. Census Bureau.

Welcome, Director Thompson.

Mr. Kevin Smith, the chief information officer at the U.S. Census Bureau.

Welcome, Mr. Smith.

Mr. David Powner, director of information technology management issues at the U.S. Government Accountability Office.

Welcome.

And Mr. Robert Goldenkoff, director of strategic issues and census issues at the U.S. Government Accountability Office.

Welcome.

And welcome to you all. Pursuant to committee rules, all witnesses will be sworn in before they testify. So if you'll please rise and raise your right hand.

Do you solemnly swear or affirm that the testimony that you are about to give will be the truth, the whole truth, and nothing but the truth?

Let the record reflect that the witnesses answered in the affirmative.

You may take your seat. And in order to allow time for discussion, I would ask that your oral testimony be limited to 5 minutes. However, your entire written testimony will be made part of the record.

And so, Director Thompson, we'll now recognize you for 5 minutes.

WITNESS STATEMENTS**STATEMENT OF JOHN H. THOMPSON**

Mr. THOMPSON. Good morning, Chairman Meadows, Ranking Member Connolly, and members of the subcommittee. I appreciate the opportunity to update you on the 2020 Census.

In June, I testified that we were on track to execute a census that is innovative, efficient, and accurate. Since then, I've appreciated the many opportunities to engage further with you, Chairman Meadows, as well as other committee members and committee staff. We've continued to make progress in our preparations, and I am proud to report that we remain on track and on schedule.

The last time I testified, we discussed the Census Bureau's Integrated Master Schedule for the 2020 Census and we provided the committee with a copy of that schedule. Our operational plan for 2020 includes 350 design decisions. As of right now, 259 of them, or 74 percent, have been made, and we are on schedule for making the rest.

We update the GAO on the schedule every month, and I would be happy to provide those updates to you and your subcommittee as well to further assure you that we are ready and on time with those systems and operations.

As described in my written testimony for the record, the Census Bureau is pursuing four key innovation areas that will make it easier for people to participate and save taxpayers more than \$5 billion. And census tests are critical as we work toward to implement these innovation areas. We learn what works and what doesn't, and we make adjustments.

Most recently, we completed our 2016 Census Test in Harris County, Texas, and in Los Angeles County, California. We tested core census operations, including how we process, store, and protect the data we receive from respondents.

As I said, we learned many lessons from the 2016 Census Test, including several notable successes and insights, such as higher response rates by using a letter as the first reminder and using language services in brochures and inserts. As in past census tests, we successfully matched the large majority of respondent addresses to our address frame with non-ID processing methods.

We expanded language support services to include Chinese and Korean. We used administrative records and third-party data to reduce the nonresponse follow-up work load for vacant and occupied addresses.

We implemented staffing ratios that increase the number of enumerators per supervisor. These staffing ratios were successful due to increased automation. We worked with the U.S. Postal Service to reduce our nonresponse workload by gaining a better understanding of mail processing, including reasons why mail can't be delivered.

And finally, we improved optimized assignments and routing for our enumerators and our use of smartphones for data collection.

Just as important as the successes, we identified areas that need improvement. These areas, which are described in detail in my testimony, include better training for enumerators, better procedures for enumerators in multi-unit structures, enhancements due to

proxy interview process, and continued development of closeout procedures for data-collection operations.

We are already implementing what we learned from the 2016 Census Test and will continue to do so to prepare for the 2018 End-to-End Test.

In addition, we began testing our address canvassing procedures and systems in parts of Buncombe County, North Carolina, and St. Louis, Missouri. And thank you to Chairman Meadows for observing our field operations earlier this month in Buncombe County. We're testing methodologies and data sources to detect new residential developments to show neighborhoods that remain unchanged since the 2010 Census.

In addition to the address canvassing test, the Census Bureau had been planning field testing operations for 2017. Due to funding uncertainty, on October 18, the Census Bureau was forced to announce that we're stopping work on two planned field tests in 2017 in Puerto Rico and on two tribal reservations. Stopping these tests is not an ideal outcome for the operational risk of the 2018 End-to-End Test and the 2020 Census, but overall it's the best option given the funding uncertainty for fiscal year 2017.

We will continue to prioritize our funding resources and activities that are critical to preparing for the 2018 End-to-End Census Test.

I should also note, and as described in my written testimony, we've awarded four significant contracts relating to the census. I'd be happy to discuss these later.

In the last three months, we've met key milestones for the 2020 Census, and we remain on track and on time. I thank the subcommittee for your continued support and interest in our work.

I am confident the Census Bureau will achieve its goal of counting everyone in America once, only once, and in the right place in 2020. And I look forward to answering your questions. Thank you.

[Prepared statement of Mr. Thompson follows:]

PREPARED STATEMENT OF

**JOHN H. THOMPSON
DIRECTOR
US CENSUS BUREAU**

2020 Census: Outcomes of the 2016 Site Test

**Before the House Subcommittee on Government Operations
US House of Representatives**

16 November 2016

Good morning Chairman Meadows, Ranking Member Connolly, and members of the Subcommittee. I appreciate the opportunity to update you on the 2020 Census. I am proud to report today that we are on time and on schedule.

In June, I testified to the Committee that we are on track to execute an innovative, efficient, and accurate 2020 Census. Since then I have appreciated the ability to engage further with you Chairman Meadows, as well as your staff and the minority staff, to further explain our exciting plans and progress to date. Today I would like to update the Subcommittee on the following topics pertinent to achieving this goal:

1. 2020 Census Goals and Operational Plan
2. CEDCaP Build vs. Buy Decision
3. Funding Uncertainty and Adjustment to Scope of 2017 Testing
4. 2020 Census Testing and Production
 - 2016 Census Test
 - In-Office Address Canvassing Operation
 - Address Canvassing Test
 - 2017 Census Test

- 2018 End-to-End Census Test
- 5. Integrated Master Schedule
- 6. Systems Development and Operational Readiness
- 7. Significant Contract Awards
 - 2020 Census Questionnaire Assistance
 - 2020 Census Integrated Communications
 - 2020 Census Technical Integrator
 - Census Schedule A Human Resources Payroll System (C-SHaRPS)
 - Upcoming Contract Awards
- 8. Content
 - 2015 National Content Test
 - Tribal Consultations
 - Residence Criteria

2020 Census Goals and Operational Plan

When we designed the 2020 Census, we focused our initial efforts on areas that are the major cost drivers of the Census. With cost reductions in mind, we focused on four key innovation areas that will bring the greatest cost savings to the 2020 Census:

1. Reengineering Address Canvassing
2. Optimizing Self-Response
3. Utilizing Administrative Records and Third-Party Data
4. Reengineering Field Operations

As a result of our efforts, we estimated that the 2020 Census will cost \$12.5 billion – compared with a cost of \$17.8 billion for repeating the paper-and-pencil-based design of the 2010 Census – representing more than \$5 billion in cost avoidance.

In October 2015, after four years of research and testing, we released the 2020 Census Operational Plan that documents the current design for conducting the 2020 Census. As the initial version of an emerging concept of operations, it reflects and supports evidence-based decision making by describing design concepts and their rationale, identifying decisions still to

be made, and describing significant issues and risks related to the implementation of the Operational Plan. An updated version of the Operational Plan was released on October 28, with updates to our planned tests and milestone schedule, program and project risks, descriptions of the census operations and decisions made, and the process for performing quality analysis.

The 2020 Census Operational Plan lays out a series of tests and decision points that the Census Bureau will make in the years leading up to the 2020 Census to develop innovative and efficient methods to increase the response rates, decrease the number of door-to-door interviews, raise workforce productivity, and streamline operations without sacrificing the accuracy of the Census. These changes have the potential to save taxpayer money, maintain accuracy, and reduce the burden on respondents. To achieve these benefits, the 2020 Census Program will rely on many of the systems covered by the Census Enterprise Data Collection and Processing (CEDCaP) approach as one key part of the overall 2020 Census Business Solution Architecture. Our CIO Kevin Smith will also discuss the readiness of these systems in his testimony.

CEDCaP Build vs. Buy Decision

The Census Bureau learned many lessons in systems development and readiness from failed efforts in 2010, and with the support of Congress has been able to develop and field test proof of concept systems as part of our series of Census Tests from 2012 through 2015 during our research and testing phase. As a result, we were able to craft a design by the end of 2015, before moving into developing robust capabilities, requirements, and business rules for our systems and operations, validated by the Census Tests conducted so far.

In May 2016, as we moved into our design implementation phase and after months of rigorous evaluation and analysis of alternatives, we made the decision to use a hybrid approach to delivering the CEDCaP solutions. We chose a commercial off-the-shelf platform integrated with select Census Bureau custom solutions that will optimally address the goal of successfully deploying an automated 2020 Census.

The resulting buy decision is helping to reduce risk for the 2020 Census and our other surveys and censuses by adopting proven technology and standards-based solutions to help deliver secure

systems and information. We selected an industry leading enterprise application development platform – the Pega 7 platform of Pegasystems, Inc. We are calling the Pega 7 platform implementation the Enterprise Censuses and Surveys Enabling platform, or ECaSE platform.

With the ECaSE team now onboard, we have been actively working to move from the vendor’s prototype into an initial system that can be deployed for the first time in the 2017 census testing programs. We are also integrating the complete suite of 2020 Census systems with the platform.

We are transitioning to the new ECaSE platform by configuring the needed applications using the validated requirements, capabilities and business rules. Proven requirements will be translated into applications during 2017 using agile development to provide fully functional applications well ahead of the 2018 End-to-End Census Test.

Additionally, we have brought in expert help through the recently awarded technical integrator contract to aid with the integration of our full system of systems, discussed in detail below in this testimony. Having a fully integrated system of systems ahead of the 2018 End-to-End Census Test is key to our 2020 Census readiness and risk mitigation. We have built and continue to maintain a comprehensive Integrated Master Schedule that allows us to ensure we are on track for systems and operational readiness for the 2018 End-to-End Census Test. We will discuss this schedule in more detail below.

Funding Uncertainty and Adjustment to Scope of 2017 Testing

We are now less than one year from beginning field work on the final major test for the 2020 Census – the 2018 End-to-End Census Test – but there is not yet clarity regarding funding for this program for fiscal year 2017.

Despite this being a critical point in the decade for testing and implementing the design of the 2020 Census, the current House and Senate fiscal year 2017 appropriations marks from the spring of 2016 fund the program at 16 and 9 percent below the President’s Budget respectively. The House funding level, just 5 percent above FY 2016, nearly eliminates funding requested in FY 2017 to fully implement the innovative design decisions that will help save an estimated \$5.2 billion relative to repeating last decade’s methods. This would be the fifth consecutive year that

the program has received appropriations significantly below the request, and we are at a point where there is a significant cost to continuing to defer work.

To address the immediate risks of this funding uncertainty, we announced on October 18 the difficult but necessary decision to stop work on two planned field test operations in 2017 on two tribal reservations – one in Washington State and the other in North and South Dakota – and in three municipios in Puerto Rico in order to prioritize funding resources on higher priority activities key to readiness for the 2018 End-to-End Census Test. Having now been forced to move these tests out of FY 2017, these sites will be considered for potential inclusion in the 2018 End-to-End Census Test. However, incorporating these into the 2018 End-to-End Census Test increases the operational risk to both the 2018 End-to-End Census Test and the 2020 Census. In 2017, we are replanning the 2017 Census Test to focus only on the activities we must test – internet self response, non-ID processing, the use of cloud technology, and Census Questionnaire Assistance, as well as completing all of the systems development and integration required for readiness for the 2018 End-to-End Census Test.

The Census Bureau made this decision now to mitigate funding uncertainty risk to the program and ensure readiness for a highly successful 2018 End-to-End Census Test, but we still require the timely appropriation of the remainder of the 2017 President’s Budget request in order to stay on track.

Let me turn to discuss some of recent and upcoming tests as well as our key production activities.

2020 Census Testing and Production

2016 Census Test

As I have already mentioned, the Census Bureau is pursuing four key innovation areas that will make it easier for people to respond and save taxpayers more than \$5 billion. Conducting a decennial census is a major undertaking with many moving parts. As we implement the operational design for the 2020 Census, we are leveraging new methods, procedures, systems, and solutions. Census tests are critical to preparing for 2020 because that is how we test the implementation of these innovation areas.

Earlier this year, we conducted a test in Harris County, Texas, and Los Angeles County, California, to study a variety of new methods and advanced technologies. The primary focus of this test was to refine the methodology for Nonresponse Followup – the operation we conduct to visit nonresponding households in person. The Census Bureau also refined methods and related activities for maximizing self-response (particularly via the Internet) to the 2020 Census. We focused testing on six operations: the questions on the 2020 Census questionnaire (content and forms design), language services, Internet self-response, allowing individuals to respond without a Census ID (non-ID processing), Nonresponse Followup, and how we process, store, and protect the data we collect from respondents (response processing)

The 2016 Census Test was a valuable learning experience, with many notable successes, including but not limited to:

- Our self-response contact strategy demonstrated a positive impact on response rates through the use of a letter rather than a postcard as a first reminder and through the use of language services such as a brochure or Frequently Asked Questions insert. In addition, the 2016 Census Test results reinforced that in some areas of the country response rates improve when we send a paper questionnaire in the first mailing.
- We validated the positive trend we have experienced in past census tests regarding collecting and processing responses without unique Census IDs, confirming our ability to successfully match a large majority of respondent addresses to our frame through real-time matching, administrative records, and clerical matching.
- Our partnership presence in the test sites generated awareness and encouraged response during both the self-response and Nonresponse Followup phases.
- We successfully expanded language support services, including Chinese and Korean (languages using non-Roman alphabets).
- Administrative records and third-party data reduced the Nonresponse Followup workload for both vacant and occupied addresses.
- Collaboration with the United States Postal Service (USPS) furthered our understanding of USPS processing of mail pieces, specifically Undeliverable As Addressed, or the

USPS-provided reason for why mail is unable to be delivered. This helped inform our assessment of vacancy status to reduce the Nonresponse Followup workload.

- Implementation of two different staffing ratios that increased the number of enumerators to each supervisor over that of the 2010 Census were both shown to be viable, due to increased automation of operational control capabilities and system generated alerts regarding enumerator performance, automated payroll submission and processing, etc.
- We improved use of optimized assignment generation and routing of enumerators and use of smartphones by enumerators for data collection.
- We added quality control by re-contacting a sample of Nonresponse Followup cases to validate the data collection in the initial Nonresponse Followup interview.

The Census Bureau leveraged the flexibility of being in a test environment to add new dimensions to the test as the opportunities arose. We gained valuable insights into areas where we must make improvements such as:

- *Better training for enumerators.* We learned from the 2016 Census Test that certain topics, such as conducting proxy interviews, require additional emphasis in the training. Balancing training content against the critical components of an enumerator's job – while also considering cost and schedule – will be key to our success. Future tests will continue to use a combination of online and classroom training for enumerators.
- *Better procedures for enumerators at multiunit structures.* In the 2016 Census Test, we implemented new procedures for contacting nonresponding addresses at multiunit structures such as apartments and condominiums. Because the layout and addressing of multiunit structures are not standard, we observed situations where the revised approach worked well and others where it did not. For example, garden-style apartments differ from high-rise complexes, and no two high-rise complexes are the same. These variations make finding a one-size-fits-all solution a challenge. As a result, we will consider enhancements that create flexibility for enumerators to assess unique situations. For example, allowing the enumerator to contact nonresponding addresses in an order that suits the layout of the multiunit structure.

- *Enhancements to the proxy interview process.* During the 2016 Census Test, if a proxy respondent, like a neighbor, could not provide the names of a nonresponding household's residents, the interview concluded and no information was captured. We need to enhance our data collection application to enable the enumerator to capture information in this situation – for example, whether the housing unit is occupied, vacant, or not a housing unit. Additionally, if the housing unit is occupied, we need to capture its population count even when no other information can be provided by the proxy. We are also considering collecting household demographics to the extent that they are known.
- *Continued development of closeout processes and procedures for data collection operations.* Our test data showed an increased number of nonresponding cases that reached the maximum number of contact attempts without a successful enumeration. In large part, this was a result of the rigor of our automation and reengineering efforts; in the test, a case was automatically removed from the workload when it reached the maximum number of attempts. Moving forward, we will closely monitor the progress of the Nonresponse Followup workload to ensure a complete and accurate count for all localities. We will monitor enumerators' performance and productivity and proactively retain enumerators who are successful in reaching respondents and completing household enumerations. We will implement procedures such that cases are actively worked until completion.

These key findings are not exhaustive, but are major themes that will inform the operational design for the 2020 Census ahead of the 2018 End-to-End Census Test.

In-Office Address Canvassing Operation

Earlier in the decade, we conducted research and testing to identify our cost-saving innovation areas. Now that the design for 2020 is in place, our testing is about refinements and integration. For 2020, we are taking an innovative approach to the way we conduct address canvassing. We are canvassing every block in-office using satellite imagery and other geospatial data. For the Address Canvassing Test, discussed below, we will walk every block in the test areas to ensure the quality of the in-office methods and procedures.

The In-Office Address Canvassing is a continuous process of monitoring the residential and nonresidential landscape to measure, assess, and ensure the completeness and accuracy of the Master Address File (MAF) and associated attributes and geospatial data.

The ultimate goals of the In-Office Address Canvassing and Review are to:

- Identify geographic areas that are stable and do not require address or geospatial updates.
- Update all living quarters in geographic areas through In-Office Address Canvassing processes. This includes group quarters, like dormitories and prisons, and transitory locations.
- Identify geographic areas that will require In-Field Address Canvassing in addition to in-office prior to the census enumeration.

The 2020 Census In-Office Address Canvassing operation has begun and is meeting the expected production goals. More than 250 geospatial clerks at the National Processing Center have reviewed 6,625,929 blocks during Interactive Review from the beginning of production in September 2015 through October 31, 2016. This process classifies the blocks into three categories:

- Passive = blocks that do not show signs of change from previous update and need no further review at this time.
- Active = blocks that show signs of change and need to move to the next phase of In-Office Address Canvassing for further review.
- On Hold = blocks that need updated imagery prior to classification as passive or active.

As of October 31, 2016, 73.6 percent of the blocks were classified as Passive, 16.2 percent were classified as Active, and 10.2 percent were classified as On Hold.

Address Canvassing Test

We began the Address Canvassing Test on September 30. The sites selected include Buncombe County, North Carolina, and part of the city of St. Louis, Missouri, and we were thrilled to welcome you to Buncombe for a field observation earlier this month. These sites were selected because they provide us an opportunity to execute the Address Canvassing Operation in an urban/suburban/rural site that is experiencing both population and housing growth, and have a mix of housing types and address styles and in an urban site that has had sustained population and housing loss and recent redevelopment. Combined, the sites have over 220,000 housing units.

The goals of this test are to:

- Measure the effectiveness of In-Office Address Canvassing through In-Field Address Canvassing.
- Measure the effectiveness of In-Field Address Canvassing (process related).
- Conduct an In-Field Relisting of a sample of blocks to collect any missed adds, deletes, and quality assurance data to help refine the Quality Control Operations for the 2020 Census.

This work will be accomplished by updating over 7,500 blocks across the sites using about 144 field staff in Buncombe and 134 field staff in St. Louis, including 8 field supervisors in each location. Some of the systems we will deploy in this test include the Listing and Mapping Instrument, updated to display imagery, Mobile Case Management, optimization and automated routing, and the Census Bureau's geospatial systems. In order to assess and accomplish the Address Canvassing Test goals, both In-Office Address Canvassing clerical staff and In-Field Address Canvassing listers will work every block in the two test sites, which allows for the comparison of results from both In-Office Address Canvassing and In-Field Address Canvassing.

The results of the Address Canvassing Test and additional research will validate our assumption of the in-field canvassing workload of approximately 25 percent of nationwide blocks in 2020.

2017 Census Test

In addition to the Address Canvassing Test, the Census Bureau has been planning for test operations in 2017 ahead of the 2018 End-to-End Census Test.

Due to funding uncertainty, on October 18 the Census Bureau announced the stoppage of work on the Puerto Rico Census Test and the field component of the 2017 Census Test. Stopping these tests is not an ideal outcome for operational risk of the 2018 End-to-End Census Test and 2020 Census, but is the best overall option remaining for the program given the funding uncertainty the program faces in fiscal year 2017.

2017 Census Test. Despite the stoppage of the field test operations in 2017, the self-response operation of the 2017 Census Test will continue. This allows the key systems and operations that must be integrated and deployed in the field in 2017 to ensure readiness for the 2018 End-to-End Census Test to remain in scope in 2017 testing.

Scheduled to occur with an April 1, 2017 Census day nationwide, we plan to conduct a test of the self-response operations and systems over a sample of at least 80,000 housing units across the country. Foremost, this will allow us to test the Internet self-response system, with a Spanish language option, and Operational Control Systems integrated with the Census Questionnaire Assistance and non-ID processing operations, as well as the ability to provision and run in a Cloud. These key systems and operations must be integrated and tested ahead of the 2018 End-to-End Census Test. We will be able to test the feasibility of collecting tribal enrollment information.

2018 End-to-End Census Test

The 2018 End-to-End Census Test is the final major field test prior to the beginning of the 2020 Census. It is scheduled with an April 1, 2018 Census day, but field operations will begin in August 2017 with the Address Canvassing operation. We will be conducting our 2018 End-to-End Census Test in at least three areas: Pierce County, Washington; Providence County, Rhode Island; and the Bluefield-Beckley-Oak Hill area of West Virginia. Collectively, the test on these three sites will cover about 770,000 housing units.

As mentioned earlier in my testimony, due to the decision to stop work on the 2017 field test operations, we will evaluate the feasibility from a cost and risk perspective of moving the 2017 field testing in Puerto Rico and tribal lands to 2018. This would potentially add approximately 131,000 housing units to the total for 2018.

The reason the 2018 End-to-End Census Test is so important is that it allows the Census Bureau to prove-in our design and validate that we are ready for the 2020 Census. In it, we will test and validate nearly all 2020 Census operations, procedures, systems, and field infrastructure together to ensure proper integration and conformance with functional and non-functional requirements. We will also produce a prototype of our geographic and data release products. Using our experiences in the 2018 End-to-End Census Test and any lessons learned, we will finalize plans for all operations and make any necessary adjustments to ensure readiness for the 2020 Census.

Integrated Master Schedule

The last time I testified, we had a discussion on the Census Bureau's Integrated Master Schedule (IMS), and I am happy to report a copy of the 2020 Census IMS was provided to this committee after the June hearing. We continue to share the Integrated Master Schedule with GAO on a monthly basis, and would be happy to continue to share it with you on a monthly basis.

The Census Bureau maintains schedule alignment between the 2020 Census Program and all of its corporate service providers at the agency, including the Census Enterprise Data Collection and Processing system (CEDCaP), through a single integrated master schedule. The 2020 Census Program Integrated Master Schedule (IMS) drives the schedule for all corporate service providers that support the program based on the key milestones. The IMS is the single schedule that all projects, including those managed by corporate service providers, interact with in order to provide status on their work on a weekly basis. Project teams may have their own detailed schedules to support day-to-day tasks in order to support the timelines necessary to meet the 2020 Census milestones. Those detailed schedules are linked to the IMS through the 2020 key milestone dates.

The 2020 Census Program IMS is developed and maintained using Primavera scheduling software capable of handling the complex requirements of the program, which falls in line with GAO recommendations. This work is guided by the 2020 Census Schedule Management Plan.

As part of the 2020 Census Program's Monthly Status Report (MSR) process, the Census Bureau provides an executive status report on the program's scheduled activities. The MSR, after review with the Department of Commerce and the Office of Management and Budget, is provided to a variety of stakeholders, including the CJS Appropriations Subcommittee staff, GAO and Office of the Inspector General.

I want to assure you the Census Bureau is ready and on-time with our systems and operations. Let me go into further detail.

Systems Development and Operational Readiness

2020 Census Architecture and Infrastructure Transition

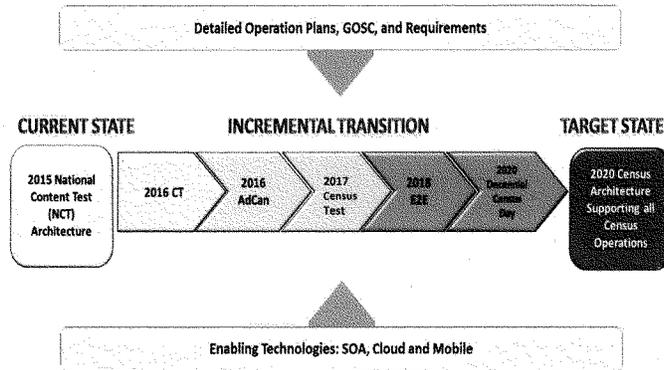
As part of establishing a framework for the technology solutions for the 2020 Census Program, the Census Bureau's Information Technology Directorate has provided overall guidance for the enterprise architecture and standards for the development of the 2020 Census Business Solution Architecture. The solution architecture defines the systems required for the successful conduct of the 2020 Census, how these systems interact, and how the enterprise systems (i.e. CEDCaP) support the 2020 Census Program. The 2020 Census Business Solution Architecture defines data flows, interoperability, interfaces, scalability requirements, and systems to be deployed in the Cloud environment. The Census Bureau has completed a set of documents to ensure alignment of the 2020 Census Business Solution Architecture with the 2020 Census Operation plan. These documents are described below.

While the 2020 Census Business Solution Architecture and the architectural framework allow us to understand what we will need in support of various 2020 Census Operations, the 2020 Census Enterprise Architecture and Infrastructure Transition plan allows us to understand the end state (the target state), when we need to have all of the solutions in place for the end state, and how we get from current state to end state.

As such, the 2020 Census Enterprise Architecture and Infrastructure Transition Plan is aligned with the 2020 Census Operational Plan, with a phased approach to support each of the Census Tests, and finally the 2020 Census. The individual Census Tests and activities demonstrate the progress in implementing the Business, Application, Information, IT Infrastructure, Security, and Quality domains transition.

The 2020 Census Architecture consists of multiple enterprise programs, including CEDCaP. Moving towards a target solution that meets the business requirements, the 2020 Census Architecture’s transition milestones align with the CEDCaP program milestones and transition activities, as well as other IT infrastructure roadmap timelines.

2020 Census Architecture Incremental Transition Model



Through a strategic approach, the transition is phased and promoted incrementally until the target state. For each Census Test and eventually the 2020 Census, a specific solution architecture is developed, verified, and validated by the appropriate stakeholders.

Leveraging the outcome of each test, new capabilities are introduced, enhancements are made, system performance and scalability are evaluated, and security is verified – all while ensuring that the milestones for each test are met.

The 2020 Census Architecture Incremental Transition Model (above) illustrates the phased testing approach supported by detailed operation plans, goals, objectives and success criteria, and importantly the business requirements as the control. The enabling technologies such as Service Oriented Architecture, Cloud and Mobile are the mechanisms.

The 2020 Census Enterprise Architecture and Infrastructure Transition plan is part of a broader set of plans, road maps, and architecture definitions, including the CEDCaP Segment Architecture and the CEDCaP Transition plan.

How the Transition Plan Relates

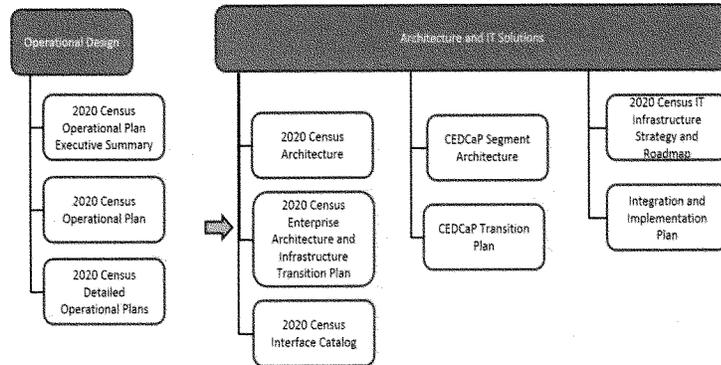
The 2020 Census Operational Plan documents the current operational design for conducting the 2020 Census. It includes a set of design decisions that drive how the 2020 Census will be conducted. The operational design also drives the requirements for IT capabilities and acquisitions.

The 2020 Census Architecture defines the target solution architecture with systems and their interfaces in support of the 2020 Census operations. It defines the infrastructure needed to handle the large scale of the 2020 Census. It also provides guidance on the development of systems that comprise the solution architecture, and communicates the architectural principles to be considered when developing or providing the capabilities for the 2020 Census.

Similarly, the CEDCaP Segment Architecture defines the target solution architecture for CEDCaP systems that will support the 2020 Census.

The 2020 Census Integration and Implementation plan provides a framework and milestones for engineering planning, and communicates key dates to project teams at the solution component level.

The CEDCaP Transition Plan, **in alignment** with the 2020 Census Enterprise Architecture and Infrastructure Transition plan and the 2020 Census Integration and Implementation plan, provides the framework and milestones for CEDCaP components.



Significant Contract Awards

Since I last testified, the 2020 Census Program has awarded four significant contracts to ensure the success of systems integration, operational readiness, and well conceived communications and outreach. We also have additional awards planned in the upcoming months.

2020 Census Questionnaire Assistance

In July, we awarded the Census Questionnaire Assistance (CQA) Contract, which will be the key way in which self-responders communicate with the Census Bureau over the phone and the Internet. This solution, which will be integrated with the full 2020 Census system of systems, will provide full service capability for two primary functions. The first is to assist respondents by providing information about specific items on the census form and answering general questions related to the census. The second is to provide a new option for respondents to complete a Census interview over the phone. Through CQA, when the public calls our 1-800 numbers we will actively help them to complete their questionnaire via the phone. This contract was awarded to General Dynamics Information Technology, which brings a management team familiar with the conduct of this operation from prior censuses.

2020 Census Integrated Communications

In August, the Census Bureau also awarded the Integrated Communications Contract. To support the national headcount in 2020, the Census Bureau is planning an integrated communications program to increase awareness of and participation in the 2020 Census. Effective and strategic communications with many diverse audiences will be crucial to the success of the 2020 Census, including everything from educating the public about the Census to maximizing response rates. This includes creating awareness and facilitating participation among all racial and ethnic groups across the Nation. The contract covers important research and data analytics; marketing; advertising; public relations; partnership support; emerging communications technologies; and project management. The Census Bureau selected the vendor Young & Rubicam, who provided services for the Census 2000 Program.

2020 Census Technical Integrator

In August, we also awarded a Technical Integrator contract. The Technical Integration contract supports all design and architecture engineering and integration activities for the 2020 Census Program – for example the integration of the system of systems for 2020. Additionally, this contract supports all the infrastructure planning and design for the data center capability (both physical and Cloud), the Regional Census and Area Census Offices, and any other designated locations. As part of determining the data center capability, the contractor will ensure our readiness for scalability of all systems and use of Cloud infrastructure, as well as provide design and disaster recovery solutions for the 2020 Census system of systems. Lastly, the Technical Integrator contract provides resources for specialized expertise in areas, such as fraud detection and security. The contract was awarded to T-Rex, which is partnered with several other companies including Leidos (formerly Lockheed Martin's IT Business) and Accenture¹, to bring to bear these important services for 2020. Of note, the management team of T-Rex has demonstrated experience on prior censuses, both within the U.S. and internationally.

Census Schedule A Human Resources Payroll System (C-SHaRPS)

¹ Other T-Rex subcontractors include: Z, Inc, General Dynamics Information Technology, SES, Whirlwind Technologies, LLC, Vidoori, and Octo.

Lastly, the C-SHaRPS contract will provide services to automate the recruiting, hiring, onboarding and separation of our Schedule A temporary staff, who work as address listers and enumerators in the field. These automated activities will replace decades-old manual processes for these activities, which frustrated both applicants and hiring managers. On October 28 we announced the award to CSRA using the Department of Commerce Support Services Initiative - Service Desk Technology & Support Blanket Purchase Agreement, and earlier this month we issued the initial call order.

Upcoming Contract Awards

Additionally, during the past six months, the Census Bureau conducted extensive market research to inform development of the “decennial device as a service” contract. This contract allows the Census Bureau to lease smartphones as the predominant mobile device for enumeration and address canvassing. This contract vehicle will ensure the best *local* telecommunication carrier when available, and will cover the mobile device provisioning, shipping, storage, and disposition. Note, we awarded a smaller “device as a service” contract as part of the testing in 2016 to better understand requirements and capabilities for the contract, which is expected to be awarded in February 2017 for the 2018 End-to-End Census Test and the 2020 Census program.

Content

There are several important initiatives for establishing the content for the 2020 Census Programs, which includes the American Community Survey (ACS) – the long-form data for the 2020 Census.

We are currently working to finalize the content that will appear on the questionnaires in the 2020 Census, having undertaken extensive research and testing as well as stakeholder consultations. The topics for the 2020 Census and ACS are due to Congress by the statutory deadline of April 1, 2017. Following the 2017 Census Test and additional consultations in 2017, we will make final determinations about the questions that will appear on the 2020 Census and ACS and submit to Congress by the statutory deadline of April 1, 2018. The following sections detail where we are in researching 2020 Census content.

2015 National Content Test

During the fall of 2015, the Census Bureau undertook a critical mid-decade study to explore ways to improve our race/ethnicity questions and to better measure and represent our Nation's myriad racial/ethnic identities. Over the past year, our research team has shared and discussed plans for testing different question designs, explained the research study plan and goals, and participated in numerous dialogues about the research plans and community feedback.

This research, the 2015 National Content Test (NCT), has provided the means for refining successful strategies to address known race and ethnicity reporting issues. The NCT builds upon the important work of the 2010 Census Alternative Questionnaire Experiment (AQE) Research on Race and Hispanic Origin and addresses racial/ethnic community feedback on improving data for our Nation's growing and diversifying populations.

The ultimate goal of this research is to improve the question design and data quality for the 2020 Census, while addressing community concerns that we have heard over the past several years, including the call for more detailed, disaggregated data for our diverse American experiences as Germans, Mexicans, Koreans, and myriad other identities.

This fall, we released the preliminary findings from the 2015 NCT research and have discussed our insights with Census Bureau advisory groups, community leaders, and the public. In early October, we convened two virtual webinars with our Census advisory committees.

On October 3, we discussed the results with our Census National Advisory Committee (NAC) on Racial, Ethnic, and Other Populations. That same week, on October 6, we discussed the results with our Census Scientific Advisory Committee. In addition, on Friday, October 28, we presented the NCT results publicly at the quarterly 2020 Census Program Management Review. We also presented the NCT results at the NAC semi-annual meeting on November 3.

We continue to discuss the research findings with our advisors, stakeholders, and the public, to address their questions and receive their feedback. We are working with the Office of Management and Budget to finalize our plans for the March 2018 Congressional submission of

our final questions for the 2020 Census. Together with OMB and our fellow federal statistical agencies, we will continue to investigate these topics for improving federal data on race and ethnicity as the OMB solicits public feedback through the Federal Register Notice process to review particular components of the current standards for data on race and ethnicity.

I am confident that the 2015 NCT research results provide a strong foundation for collecting 2020 Census data, which will more accurately reflect our diverse racial/ethnic communities in the United States.

Tribal Consultations

Another aspect in our preparations for the 2020 Census are the tribal consultations we have held across the country since 2015. The consultations are a critical part of overall communication and outreach efforts directed at ensuring an accurate, cost-effective population count in 2020. I am personally involved in our tribal consultations and I am excited about the collaboration we have had and will continue to have with tribal leaders.

Based on lessons learned from our 2007 tribal consultation meetings we began our tribal consultations two years earlier than last decade. The first round of consultation began in October 2015 and went through March 2016, with eight consultations around the country. We concluded with a national webinar on April 7, 2016. We began our second round of followup meetings in September and they will continue through this month. Building awareness about the importance of the 2020 Census is essential in motivating response to the census in communities across our diverse Nation, including the American Indian and Alaska Native population both on and off tribal lands.

We are keen to build on our government-to-government relationship to receive feedback. During our consultations, we have heard from tribal leaders on topics such as outreach and promotion, data collection operations, content, geography and others.

In response to extensive discussion regarding the importance of tribal enrollment data during the 2007 American Indian and Alaska Native Tribal Consultations and a formal request from the

U.S. Department of Housing and Urban Development (HUD), the Census Bureau committed to testing the feasibility of a tribal enrollment question in a Census environment. The Census Bureau is currently exploring the feasibility of collecting data on tribal enrollment through a combination of qualitative and quantitative testing. The qualitative testing consisted of focus groups and cognitive interviews.

At this time, we have made no decision about adding the tribal enrollment question to the 2020 Census. We are testing the feasibility of collecting the information and we are still in consultations with the tribes and other agencies.

Residence Criteria

We have been working on our plans for the 2020 Residence Criteria and Situations. In May 2015, we issued a Federal Register notice requesting public comment on the 2010 Residence Rule and Residence Situations. We then published a Federal Register Notice on the proposed 2020 Census Residence Criteria and Situations on June 30, 2016. Public comments were accepted through September 1, 2016.

We received almost 78,000 public comments to the June 30th Federal Register Notice. We are currently evaluating these comments and we aim to have responses to the comments by the end of the year. The vast majority of the comments were on where we tabulate prisoners. The Census Bureau plans to release the final 2020 Census Residence Criteria and Residence Situations by the end of 2016.

In the 2010 Census, we tabulated prisoners at the facility where they usually lived at the time of the Census using records provided by prisons, which was consistent with the concept of usual residence. Our proposed 2020 Census Residence Criteria and Residence Situations include a proposal to continue to count prisoners at the facility where they usually lived at the time of the Census. However, we are also assessing the feasibility of counting prisoners elsewhere.

In the 2010 Census, we worked with the Department of Defense to count members of the Armed Forces and federal civilian employees serving overseas, as well as their dependents living with them, at their “home of record” for the purposes of apportionment.

Our proposed 2020 Residence Criteria and Residence Situations include a proposal to count military personnel temporarily deployed overseas at their usual residence in the United States, using administrative data from the Department of Defense. We are currently evaluating the ability to integrate these data successfully into the resident population counts.

We also proposed to continue counting military and civilian employees of the U.S. Government who are stationed or assigned outside the United States, and their dependents living with them, in their home state, also known as their “home of record,” for apportionment purposes only. We are currently evaluating public comments made in response to the Federal Register Notice on this proposal.

Throughout this process, we have engaged our key stakeholders, including Congress, by having extensive discussions about the Residence Criteria and Residence Situations. I thank the Subcommittee for your continued support and interest in our work. With your support, I am confident the Census Bureau will achieve its goal of counting everyone in America once, only once, and in the right place in 2020. I look forward to answering your questions. Thank you.

Mr. MEADOWS. Thank you, Director Thompson. And thank you for keeping the dogs away from both of us when we were out there doing the field test.

Mr. Smith, you are recognized for 5 minutes.

STATEMENT OF KEVIN B. SMITH

Mr. SMITH. Chairman Meadows, Ranking Member Connolly, and members of the subcommittee, thank you for the opportunity to testify this morning. I am pleased to update you on our ongoing work to make the 2020 Census a success.

I began my role as chief information officer at the Census Bureau over 4 months ago. Since then I've gained a deep appreciation of the steps the Bureau has taken to introduce innovations into their operation processes and supporting technology to make the 2020 Census more effective and efficient than ever before.

The Census Bureau has taken positive steps to innovate with technology, not invent technology, by using industry available solutions wherever possible.

I have been involved in developing first-of-their-kind industry solutions and large-scale technology modernization efforts in both government and in the private sector. I'm excited and honored to lead the IT team that will help deliver the most automated census ever.

I have spent much of my time at the Census Bureau reviewing the IT organization and the Bureau's technology and governance. We have a talented staff of IT professionals, and the foundation for a successful census is in place. I am particularly pleased with the start of our new CEDCaP chief security engineer in July. He has a rich background in information security, a strong history of private sector experience, and a wealth of knowledge about securing federal information systems.

I'd like to focus today on two key areas, our cybersecurity and the progress of the Census Enterprise Data Collection and Processing program, known as CEDCaP. We take the task of ensuring the integrity and security of our systems and data against the evolving landscape of cybersecurity threats very seriously. Our cybersecurity approach will ensure that individuals have limited, appropriate access to 2020 Census data. We'll keep the census systems running through possible cyber threats by taking informed actions in redundant systems with layers, isolation, views, and encryption whenever and wherever possible.

We're committed to partnering with industry and other Federal agencies to leverage their cybersecurity services and to create as strong a cybersecurity posture as possible. In particular, we have engaged the Department of Homeland Security to review our design and security architecture for the 2020 Census systems. In addition, we have reached out to the National Security Agency and other offices within the Department of Commerce for assistance in threat identification and management.

During the 2020 Census, we'll focus on phishing threats through respondents and Census Bureau employees. For respondents, we will work closely with our Integrated Communications Contract to address the threat of phishing both before and during the 2020 Census.

Within the Census Bureau, we conducted regular cybersecurity training and phishing evaluations to educate our employees. We have also worked with DHS to evaluate and test our procedures for phishing. We will use an industry-leading solution to detect rogue and suspect emails and Web sites impersonating the Census Bureau. And finally, we will leverage the security protections of our cloud service providers for additional layers of security.

The CEDCaP program has been underway since 2015. Much work remains. In May, the Census Bureau announced the decision to unify the functions of a number of existing systems onto a single platform-based COTS solution. The transition to the COTS platform for the 2020 Census began in June.

The CEDCaP systems are built using an agile development approach that allows us to work closely with the decennial business product owners. This approach ensures that we deliver the right level of technology incrementally and make the most effective improvements for the census.

We are hard at work to deliver the new version of the previously tested Internet self-response capability in the 2017 Census Test. Overall, for the 2018 End-to-End Test, half of the systems needed are already in use and going through enhancements. Over half of the needed systems will be ready for system-integration testing within the next 6 months.

Looking ahead, I believe the measures we are taking will prepare us to react to any difficulty, including the threat of cyber attacks. Preserving the integrity and security of our systems and data is a top priority.

First, we will protect the data we collect. And, second, we will sustain secure data-collection services so that respondents may confidently respond to the 2020 Census. To do that, we will layer our technology in ways that isolate data and systems from each other with the views that let us take immediate action when a threat is detected.

This approach puts in place the majority of the technical security controls that we need to protect the data and systems from threats. This allows for systems to inherit best practice technical security within the framework while we continue to develop the systems.

GAO recently expressed the importance of engaging service providers and the IT vendor community to help mitigate risks, and I completely agree with their recommendation.

With the continued hard work from our team and congressional support, I am confident the Census Bureau can achieve our objectives. I look forward to discussing other aspects of our planning for the 2020 Census with you. I am grateful for this opportunity to testify before the subcommittee, and I am pleased to answer any questions you have. Thank you.

[Prepared statement of Mr. Smith follows:]

**STATEMENT
of
Kevin Smith
Associate Director and Chief Information Officer
of the U.S. Census Bureau
Before the
U.S. House of Representatives
House Oversight and Government Reform Committee,
Subcommittee on Government Operations**

Chairman Meadows, Ranking Member Connolly and members of the Subcommittee, thank you for the opportunity to testify this afternoon. I am pleased to update you on the status and ongoing work to ensure the success of the 2020 Census.

I began my role as Chief Information Officer of the Census Bureau over four months ago. Since then, I have gained a deep appreciation of the visionary steps the agency has taken to introduce innovations into their operational processes and supporting technology to make the 2020 Census more effective and efficient than ever before. The tight connection between technological capabilities and operational processes is clear, and demonstrates the need to have the right level of technology in place to support the operational tests for the 2020 Census. The Census Bureau has taken positive steps to *innovate* with technology – not *invent* technology – by utilizing industry available solutions wherever possible. I have been involved in developing first-of-their-kind industry solutions and large-scale technology modernization efforts in both government and the private sector. I am excited and honored to lead the IT team that will help deliver the most automated census ever.

I am under no illusions that the task before us is an easy one; in fact, it is very difficult. I have spent much of my time at the Census Bureau reviewing the IT organization, as well as the technology, governance and innovation processes that are currently in place. My observations are that the foundation to carry out a successful census is in place.

However, we still have a lot of work ahead of us. I would like to focus on two key areas: our cybersecurity approach to ensuring the integrity and security of our systems and data, and the progress of the Census Enterprise Data Collection and Processing (CEDCaP) program.

Our cybersecurity approach will ensure that individuals have limited and appropriate access to 2020 Census data by developing redundant systems with layers, isolation, encryption, and views that enable us to act according to possible threats. For example, within the Census Bureau we conduct our cybersecurity awareness training and phishing evaluations to educate our employees. We have also worked with the U.S. Department of Homeland Security (DHS) to evaluate and test our procedures for phishing. This will enable us to find and fix potential vulnerabilities before a compromise occurs. On enumerators' mobile devices, we are using two-factor authentication, encrypting data at rest and in transit.

We take the task of ensuring the integrity and security of our systems and data against the ever-evolving landscape of cybersecurity threats very seriously. We have engaged industry and other Federal agencies, most prominently DHS (Cybersecurity Assurance Branch – Federal Network Resilience), to assist us in reviewing our design and security architecture for the 2020 Census systems. In addition, we have reached out to the National Security Agency (NSA) (Customer Advocate and Information Assurance Sections) and other offices within the Department of Commerce (DOC) (Investigations and Threat Management Division) for assistance in threat identification and management.

The Census Bureau also works very closely with the Department of Commerce Office of the Chief Information Office (OCIO). The coordination between Census and the Department has been seamless and significant. Incident response, the Enterprise Security Operations Center (ESOC), High Value Asset (HVA) assessments and Continuous Diagnostic and Mitigation are areas where the Department has improved cybersecurity on behalf of Census. In addition, the implementation of FITARA within Census has provided a greater level of visibility for Census investments at the Department.

We are already using recognized cybersecurity services from DHS and industry. The Census Bureau uses and supports the DHS programs for EINSTEIN, employing EINSTEIN 3 Accelerated, and Continuous Diagnostics and Mitigation (CDM). We use cloud and internet service providers to protect against Distributed Denial of Service (DDoS) attacks. Within our infrastructure, we have additional security at the perimeter and internally to ensure the protection of Census Bureau data, as discussed in previous hearings. We are committed to continuing to partner with industry and other Federal agencies to use cybersecurity services throughout

multiple layers of our systems. This will create as strong a cybersecurity posture as possible to advance our visibility and protection against these evolving threats.

The Census Bureau's IT and cybersecurity program provides protection to not only our IT infrastructure and systems. More importantly, it protects the personal and business information we collect from our respondents, and the administrative data we receive from other agencies to support our mission. I am very confident in our ability to protect the information and information systems through our current policies and processes. We will continue to enhance those policies and processes as we implement new tools and technologies to address the evolving threat environment.

Current Environment

The Census Bureau environment currently consists of 29 uniquely defined, Federal Information Security Act (FISMA) reportable systems. These systems are comprised of 542 technology components, such as physical security, environmental, centralized identification management, backup, etc. Program areas can use these components to reduce the cost and time to assess their systems, as well as reduce the overall IT management responsibilities for which their staff are responsible.

To secure this environment, our IT/cybersecurity program is multi-dimensional, multi-level, and multi-governed. We look at all aspects of the Census Bureau's mission and determine how to provide the security needed to successfully accomplish that mission, while providing a high level of confidence to our respondents and partner agencies.

Multi-dimensional

Our IT/cybersecurity program looks at people; physical security; infrastructure; IT systems; how our IT systems interface with other systems (both inside the Census Bureau as well as externally); the applications used to collect and process the information; and the data themselves.

People – People are perhaps the most important component of this multi-dimensional process. They can be the strongest link we have to ensure our systems and data security by implementing appropriate security controls and ensuring they are operating as intended. People can also be the weakest link – by committing human error in system administration, database administration, or

programming, by becoming victims of phishing scams, or by visiting malware-infected internet sites. We require certain levels of security to be in place prior to allowing people – whether employees or contractors – to access our IT systems. We also require background investigations appropriate to the position sensitivity, the issuance of a multi-factor ID card that is required to access the network, authorization to individual systems and accounts, and regular awareness training.

Threats may also originate from people within the organization, “insiders” such as employees, former employees, contractors or business associates, who have information concerning the organization's security practices, data and computer systems. Recognizing this potential threat, the Census Bureau has engaged with the Insider Threat Center at Carnegie Mellon University to review our current posture and recommend areas where we can strengthen the program. The Census Bureau will use these and future discussions with Carnegie Mellon to improve our insider threat program to provide additional protection to the data we collect, process and disseminate.

Physical security – We make sure that our people, systems, and data are protected from physical threats. In coordination with the Office of Security, we review the IT security controls in place. This includes the application of Interagency Security Committee standards for physical access to buildings, physical access controls to sensitive spaces such as server rooms, and continuing security education.

Infrastructure – Our infrastructure is key to mission success. This includes the environmental controls at our Bowie Computer Center and the National Processing Center, and our redundant telecommunications infrastructure that provides automatic failover to make sure that we can complete our mission successfully and securely. Some examples of the infrastructure security tools we use include the security assessment and monitoring of processes, routers, switches, firewalls and our load balancers.

IT systems – IT systems are defined as servers, PCs, storage, databases, laptops, mobile devices, etc. These are all assessed and must have a formal approval to operate, whether internally at the Census Bureau or externally at a contractor site or in the cloud environment. The Office of Information Security (OIS) uses the Risk Management Framework to ensure the required

security controls are in place and assessed prior to any authorization. OIS also assigns IT Security Engineers to support Census Bureau IT projects during all phases of the system development life cycle. Additionally, each system is assigned an Information System Security Officer (ISSO) who is assigned to the OIS and directly supports the System Owner. The ISSO works closely with the System Owner prior to and following the formal authorization process, and ensures the security remains in place and effective while the system is in production. Each system has a secure configuration baseline in place. This baseline and security patches are checked each month through automated scanning.

Interfaces – In addition to assessing the servers, databases, and storage individually, the interfaces needed for these IT resources to work with each other securely and efficiently are documented and reviewed by IT security staff, the System Owners, and Authorizing Officials.

Applications – Applications are the lynchpin to any IT system’s ability to successfully support its mission as intended. Applications are also becoming a favored, if not the most favored, point of attack. This threat is increasing for a variety of reasons, but primarily we are getting much better at hardening our systems and databases at the core level. On the other hand, applications are developed by people – either employees or contractors of the Census Bureau, or through a commercial off the shelf (COTS) product. To address this, we scan the application code of our internet-facing web applications on a regular basis, based on risk.

Data - The Census Bureau’s mission is to serve as the leading source of quality data about the Nation’s people and economy. Our data are an essential component of that mission. If we do not protect data, we cannot maintain the level of trust we need for respondents and our partners to provide us their information. Data are the most important element of our multi-dimensional IT/cybersecurity program; all the other areas provide protection to this core element. Our data are contained in databases or in our storage and backup processes, and we provide the security at those levels. We also use the process of ‘least privilege’ to ensure that only the appropriate, authorized people actually have access to it – and only for mission-related purposes. We have approved a design pattern to require data to be encrypted in transit and at rest. We verify that databases meet the encryption requirement, or have a formal Plan of Action and Milestone to ensure that they will. We monitor this through formal access control permissions, auditing, and

continuous monitoring. We continue to look at additional automated tools to provide protection from potential insider threat to our systems or data.

Continuous Improvement

The cyber threat continues to grow and evolve, especially as we rely more on emerging technologies like the cloud and social media, and as we use more open, transparent processes and reengineer and modernize our operations. To meet this growing challenge, our IT/cybersecurity program must continue to grow and evolve as well. We must continually develop the controls and processes to address our adversaries' intentions to steal our data or disrupt our operations, while maintaining a balance that provides for the successful completion of our core mission.

The Census Bureau takes seriously its responsibility to protect respondent data and is engaged in this regard on a number of cybersecurity and technology fronts:

Phishing

The U.S. Government Accountability Office (GAO) identified a few key cybersecurity areas in its latest report (released September 8, 2016). In particular, GAO raised concerns surrounding the Census Bureau's approach to minimizing the threat of phishing and ensuring appropriate access to 2020 Census data, while having adequate controls for internet data collection systems supported in a cloud environment. Similar to our approach in 2010, the Census will use an industry leading company, MarkMonitor, to provide brand and fraud protection on the internet by detecting rogue and suspect emails and websites impersonating the Census Bureau. This service will help preserve the Census Bureau's public presence by helping to eliminate fraudulent impersonations of the Census Bureau online. The service continuously monitors web traffic for potential brand abuse, such as unauthorized domains or websites; false associations; brand impersonations; cybersquatting; and other threats. We also use a service that inspects email traffic sent to ensure that others are not attempting to pass themselves off as the Census Bureau via email. The service compares technical information in the email traffic to validate it.

The Census Bureau is implementing several additional strategies to protect against phishing scams. First, we are developing an internal communications plan to reinforce our employees' understanding of security awareness and their role in protecting the Census Bureau. Second, we

are working with the Integrated Communications Contract for the 2020 Decennial Census to develop messages and communication tools for the public on phishing and other cybersecurity threats. We are increasing our use of the PhishMe service to conduct regular anti-phishing exercises for all Census Bureau employees and contractors. Finally, we have acquired a technology that will ‘detonate’ attachments and links embedded in emails in a ‘sandbox’ environment, to keep them from reaching the Census Bureau network. We are currently working to implement this within the infrastructure.

Access Management

The Census Bureau is implementing layered protection for our internet data collection system. We are exploring several strategies, including the possibility of distributing applications across multiple cloud vendors, so that security issues in one layer would not affect the entire system. We are also working within the Census Bureau to reinforce business rules for incident handling, including escalation and decision points, and to ensure that they are clearly documented and well understood across the agency.

Mobile

The Census Bureau plans to deploy mobile solutions in support of the 2020 Census. We employ a range of security measures to protect our systems and data on mobile platforms. We currently use AirWatch as the Mobile Application Manager (MAM). The MAM allows us to manage Census Bureau applications, make changes to them when needed, ensure the security settings of the application, and wipe applications remotely if necessary. Further, Census Bureau enumerators use a six-digit PIN to access the device, and a 10 character password to authenticate to the application. Data are encrypted at rest on the device, and collected information is transmitted as soon as the case is closed and the device is connected to the internet. Finally, data are transmitted via secure protocols from the field to the Census Bureau.

Cloud

The advent of cloud services provides us with an opportunity, as well as some security challenges. Cloud services and providers must be FedRAMP certified. Additionally, cloud implementations must meet all Census Bureau security requirements for sensitive data. To

provide additional assurances, we leverage other government agencies (DHS, NSA, DOC Office of Security Supply Chain Risk Assessment staff, etc.) to review security architecture and assist in testing. We also plan to engage in independent testing, by government agencies as well as contractors, during the FY 2018 test to explore options for fraud protection. Finally, as with any Federal IT system, we must ensure that continuous monitoring is conducted on Cloud solutions, as required by FISMA and FedRAMP.

CEDCaP

The CEDCaP program has been underway since 2015. CEDCaP follows standard enterprise processes for systems development, and some components have already been deployed into production. While much work remains, we are pleased with our efforts to date and remain on schedule for a successful 2020 Census. We have begun the process to configure business rules and models for the 2020 Census, while building the base enterprise capabilities that can be extended for use by other programs.

In May 2016, the Census Bureau announced a decision to unify the functions of a number of existing systems onto a single platform-based COTS solution. This covered our major operational control, internet self-response, address listing and mapping, case management, and mobile collection and management applications, among several others. This hybrid COTS solution will address the short-term goal of deploying the 2020 Census, and build the infrastructure to transition to the long-term goal of CEDCaP's future state to support all surveys and censuses.

The transition to the COTS platform for the 2020 Census began in June 2016 with the formation of the transition team and new 2020 Census development teams, supported by the platform vendor. We quickly updated the 2020 Census Integration and Implementation Plan, 2020 Census Transition Plan, and the CEDCaP Transition Plan to reflect the required readiness dates for test, production, and operations. The CEDCaP systems are built using an Agile Development approach that allows us to work closely together with the Decennial business product owners to improve our ability to deliver the right level of technology. This approach will continually build upon previously released capabilities to iteratively make the most effective improvements for the

Census. The teams are hard at work, and, before the end of the calendar year we will begin end-to-end thread testing for all systems of the 2017 Census Test.

The 2020 Census schedule is integrated with all supporting programs, including CEDCaP. The 2020 Census Program Integrated Master Schedule drives the schedule for all corporate service providers that support the program based on the 2020 Census Program key milestones. The 2020 Census Integrated Master Schedule is the single schedule into which all projects – including enterprise solutions like CEDCaP and the Center for Enterprise Dissemination Services and Consumer Innovation (CEDSCI) – provide weekly status reports. Project teams have their own detailed schedules to support day-to-day tasks that are linked to the integrated master schedule. Because of its complexity, the 2020 Census Program integrated master schedule is developed and maintained using Primavera scheduling software, which meets the required capabilities recommended by GAO. On a monthly basis, the Census Bureau shares the updated integrated master schedule with GAO.

The 2020 Census/CEDCaP schedule integration has taken positive steps to manage the interdependencies between these programs, as acknowledged by GAO. We agree that the Census Bureau must maintain schedule alignment between the 2020 Census and CEDCaP through a single integrated dependency schedule, and we align key milestones and update statuses between the programs weekly. GAO recommends additional actions to better align the programs, such as having an integrated list of all interdependent risks, and finalizing a processes for managing requirements. We already maintain a comprehensive risk register for the 2020 Census and its dependent project level solutions, including CEDCaP. This risk register undergoes regular reviews at the program level, and quarterly reviews by Census Bureau senior leadership, to examine and monitor the highest-level, crosscutting risks. As GAO noted, we have drafted an enterprise requirements management plan and we are currently following that process. We are completing the final reviews of the supporting documentation, and it will be completed by the January 2017 deadline set out in GAO's report.

The CEDCaP program is working to address GAO's additional recommendation in its report "Better Management of Interdependencies between Programs Supporting 2020 Census Is Needed," released on September 8, 2016. We agree with GAO's assertion that the program office estimate needs to be updated, and have developed a plan to do so and begun that effort.

CEDCaP will follow the *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* when producing annual updates to the program office estimate. We also agree with the GAO's recommendation that we must improve the CEDCaP risk management process used by all the projects. Over the past several months, we have updated the CEDCaP Risk Management Plan and the corresponding standard operating procedures. The established plans and standard operating procedures identify roles and responsibilities for risk management. We established a risk team that assists the projects and risk owners with implementing their risk management process, including documenting risks with trigger dates and completing the detailed mitigation plans for all high risks. The team also audits each project risk register monthly to validate that the risks are properly documented, monitored, and updated.

Looking ahead, in my opinion, the measures we are taking will prepare us to react to any difficulty, and to predict incidents such as cyber attacks. Preserving the integrity and security of our systems and data is a top priority. First, we will protect the data we have already collected, and second, we will sustain secure data collection services so that respondents may continue to confidently provide responses to the 2020 Census. To do that, we will layer our technology in ways that isolate data and systems from each other, with views that let us take the appropriate and immediate action when a threat is detected. We are looking at designing our system to use multiple cloud providers, so there is no single point of failure in the architecture. We are separating out the individual processes into layers, so we can address specific security controls and decision points independently. We have strengthened our work with other agencies to assist in reviewing the security architecture and design of the system, and we are seeking assistance from DHS and NSA to help with penetration testing on the new CEDCaP COTS platform. Finally, we are looking into hiring an independent organization to help test vulnerability to fraud in the non-ID response process during the 2018 End-to-End Census Test. GAO has recently noted the importance of engaging service providers and the IT vendor community to help mitigate risk, and I completely agree with its recommendation.

I would be remiss if I did not mention how impressed I am with the personnel at the Census Bureau. We have some of the most mission-oriented, talented IT professionals in all the Federal Government. And we have the team we need to be successful. I am particularly pleased with the

start in July 2016 of our new CEDCaP Chief Security Engineer. He brings with him 20 years of background in the field of information security, a strong history of private sector experience, and a wealth of knowledge about what it takes to secure Federal information systems.

With hard work from our team and Congressional support, I am confident the Census Bureau can achieve its objectives. I look forward to discussing other aspects of our planning for the 2020 Census with you. I am grateful for this opportunity to testify before the Subcommittee, and I am pleased to answer any questions you may have.

Thank you.

Mr. MEADOWS. Thank you, Mr. Smith.
Mr. Powner, you are recognized for 5 minutes.

STATEMENT OF DAVID POWNER

Mr. POWNER. Chairman Meadows, Ranking Member Connolly, and members of the subcommittee, thank you for inviting us to testify on the Bureau's plans to deliver tests and secure key technologies for the 2020 Census.

Clearly, utilizing an Internet response, mobile devices for enumeration follow-up, and cloud solutions are important steps to improving our Nation's response rates and securing citizens' data. However, the Bureau has a history of poor IT delivery, and many of the broader IT initiatives this committee has focused on during this Congress are major challenges at the Bureau, including appropriate CIO authority, delivering incrementally, having the right governance and accountability over IT acquisitions, and securing systems and information.

This morning, I'd like to focus on what needs to be done to deliver and secure these technologies.

First, integrate IT deliverables with the 2020 schedule. My colleague, Carol Harris, made this point repeatedly before this committee at prior hearings, and this is still clearly a major issue since several of the IT schedules are still being developed. Clearly, schedule risk is a bright red risk at this point.

Oversee delivery and readiness of the 50-plus systems. The Bureau needs to deliver about 50 systems to be included in the 2018 End-to-End Test starting in August of next year. I have a figure in my written statement that shows half of those systems are to be delivered after the start of the End-to-End Test or that they lack firm delivery dates.

Clearly, the 12 projects associated with CEDCaP, including the Internet response capability, mobile devices, and the centralized operations component are critical systems.

A key question with CEDCaP commercial products is the amount of customization that the Bureau plans. Modifying these products will have cost and schedule implications that we plan to monitor closely.

Next, they need to oversee integration activities. An integration contractor recently began work in October. The contractor is responsible for delivering and implementing a decennial system of systems. The staffing plan here includes hundreds of contractors and a cost of about \$900 million. The contractor acknowledges the key risks are schedule, scalability, and security.

Currently, they are working on detailed schedules. It is very important for the Bureau to oversee this contractor's work and the associated costs. Currently, the Bureau is expanding its program management office by about 40 staff to do so. We think this is very important, but also very late in the game to be doing so.

Next, they need to make decisions on infrastructure. The integration contractor is working on an analysis of infrastructure needs. Decisions need to be made on data centers and security operation centers.

Next, they need to improve IT governance. Overseeing the delivery of the 12 CEDCaP systems, the additional 40 systems, and in-

tegration and testing activities is extremely important. The Bureau has several governing boards to do this, including the CEDCaP in 2020, executive steering committees.

Most of this is the direct responsibility of the 2020 office, not the CIO. This is another instance, Mr. Chairman, where the delivery of key systems is not under the direct authority of the CIO.

Mr. Smith, though, to his credit, has assured us that he can manage risks associated with IT through these governing bodies. We hope he is right, and we will be continuing to monitor this for the committee.

To do so, we'll need meeting minutes of these governance bodies, and even better yet, we'd like to be observers at key governance meetings.

To the Bureau's credit, we like agile development, commercial products, and using an integration contractor that does include subcontractors with prior census experience.

However, Mr. Chairman, I'd like to point to a hearing you and Chairman Hurd, along with Ranking Member Kelly, held this summer on 18F and the digital service teams, and I wonder why these private sector experts are not engaged with the decennial IT deliverables. Clearly, the Bureau could use help in this area.

Turning to security. The Bureau needs to continue its diligence in this area, since it has been the target of recent data breaches; although, it has been reported that no personally identifiable information was compromised. Moving forward, we have ongoing work that will focus on the Bureau minimizing the threat of phishing, securing 300 mobile devices, securing cloud services, and properly configuring the 2020 systems.

A key oversight area for this committee will be the authority to test and operate the many systems associated with the decennial.

In conclusion, there is a lot to do over the next 9 months leading to the End-to-End Test, and not everything is completely decided or defined. Decisions, delivery, integration, and testing needs to occur and needs to be closely monitored.

In addition, the IT costs of the decennial needs much more transparency. Right now, the total IT cost for the decennial is not clear, but we will be getting you solid numbers with our upcoming review. Look forward to your questions.

[Prepared statement of Mr. Powner follows:]



United States Government Accountability Office

Testimony before the Subcommittee on
Government Operations, Committee on
Oversight and Government Reform,
House of Representatives

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INFORMATION TECHNOLOGY

Uncertainty Remains about the Bureau's Readiness for a Key Decennial Census Test

Statement of David A. Powner, Director,
Information Technology Management Issues

GAO Highlights

Highlights of GAO-17-221T, a testimony before the Subcommittee on Government Operations, Committee on Oversight and Government Reform, House of Representatives

Why GAO Did This Study

The U.S. Census Bureau (a component of the Department of Commerce) plans to significantly change the methods and technology it uses to count the population with the 2020 Decennial Census, such as by offering an option for households to respond to the survey via the Internet. The Bureau's redesign of the Census program relies on the acquisition and development of many new and modified systems. Several of the key systems are to be provided by an enterprise-wide initiative called CEDCAP.

This statement summarizes the report GAO issued in August 2016 on the challenges the Bureau faces in managing the interdependencies between the 2020 Census and CEDCAP programs, as well as challenges it faces in ensuring the security and integrity of Bureau systems and data. GAO also updated key information based on its ongoing work for this committee by, among other things, reviewing the updated 2020 Operational Plan and systems lists provided by the Bureau, and by interviewing agency officials.

What GAO Recommends

In its August report, GAO made eight recommendations to the Department of Commerce. The recommendations addressed, among other things, deficiencies in the Bureau's management of interdependencies related to schedule, risk, and requirements. The department agreed with all eight recommendations and indicated that it would be taking actions to address them.

View GAO-17-221T. For more information, contact David A. Powner at (202) 512-9286 or pownerd@gao.gov.

November 16, 2016

INFORMATION TECHNOLOGY

Uncertainty Remains about the Bureau's Readiness for a Key Decennial Census Test

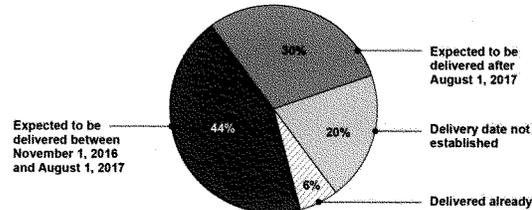
What GAO Found

The U.S. Census Bureau's (Bureau) 2020 Decennial Census program is heavily dependent upon the Census Enterprise Data Collection and Processing (CEDCAP) program to deliver the key systems needed to support the 2020 redesign. CEDCAP is a complex modernization program intended to deliver a system-of-systems for the Bureau's survey data collection and processing functions. In August 2016, GAO reported that while the two programs had taken steps to coordinate their schedules, risks, and requirements, they lacked effective processes for managing interdependencies. Officials acknowledged weaknesses in managing interdependencies and reported that they were taking steps to address them. Until these interdependencies are managed more effectively, the Bureau will be limited in its ability to meet milestones, mitigate major risks, and ensure that requirements are appropriately identified.

While the large-scale technological changes for the 2020 Decennial Census introduce great potential for efficiency and effectiveness gains, they also introduce many information security challenges. For example, the introduction of an option for households to respond using the Internet puts respondents more at risk for phishing attacks (requests for information from authentic-looking, but fake, e-mails and websites). The Bureau had begun efforts to address a number of these challenges; as it begins implementing this decennial census' design, continued focus on these considerable security challenges will be critical.

Looking forward, there is uncertainty as to whether the Census Bureau will be ready for the 2018 end-to-end test, set to begin in August 2017. GAO has ongoing work for this Committee that is evaluating the significant challenges the Bureau faces in developing, testing, integrating, and securing systems prior to the 2018 test. For example, of the 50 systems to be included in the end-to-end test, half of them are to be delivered after the start of the test or lack a firm delivery date (see figure). In addition, key dates for the integration of the systems have not yet been defined. Given the short window of time before the test is to begin, it is important that the Bureau continue to focus its attention on implementing and securing the data collection systems that are to collect and store the personal information of millions of American people.

Figure: Status of Systems to be used for the 2018 End-to-End Test



Source: GAO analysis of Census Bureau data. | GAO-17-221T

Chairman Meadows, Ranking Member Connolly, and Members of the Subcommittee:

I am pleased to be here today to discuss the U.S. Census Bureau's (Bureau) approach to delivering an enterprise information technology (IT) initiative, referred to as the Census Enterprise Data Collection and Processing (CEDCAP) program, and its efforts to ensure the integrity and security of systems and data to be used in the 2020 Decennial Census. CEDCAP is a large and complex modernization program intended to deliver a system-of-systems for all the Bureau's survey data collection and processing functions, rather than continuing to rely on unique, survey-specific systems.

CEDCAP is particularly important because it is intended to support significant changes in how the Bureau (which is a part of the Department of Commerce) is planning to conduct the 2020 Census. Specifically, the Bureau is aiming to modernize and automate its outdated and inefficient methods of conducting decennial censuses. This includes plans to significantly change the methods and technology it uses to count the population, such as offering an option for households to respond to the survey via the Internet; enabling a mobile data collection application for field-based enumerators¹ to use on mobile devices to collect survey data from households; and automating the management of field operations. These new capabilities and supporting systems are expected to be delivered by CEDCAP.

With less than a year remaining before the Census 2018 end-to-end test is to begin in August 2017 (which is intended to test all key systems and operations to ensure readiness for the 2020 Census), this hearing is especially timely. My statement today will discuss (1) issues the Bureau has had in managing interdependencies between the 2020 Census and CEDCAP programs, (2) potential information security challenges the Bureau faces in its redesigned 2020 Census program, and (3) uncertainty about the Bureau's readiness for the 2018 end-to-end test. Further, in a separate statement today, my colleague will address the Bureau's

¹Enumerators are individuals 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.

progress in preparing for the 2020 Census, based on 2016 census testing.²

The information in this testimony is based primarily on the report we issued in August of this year, which discusses, among other things, the Bureau's progress in developing, implementing, and monitoring the CEDCAP program.³ More details on our scope and methodology are provided in that report.

In addition, we obtained information on the current status of and key questions facing the 2020 Census through ongoing work we are conducting for this Committee. To do this, we reviewed Bureau documentation, including the updated 2020 Operational Plan, program-level risk registers, an inventory of IT-related decisions, and a list of systems and delivery dates provided by the Bureau; we also interviewed agency officials. We did not evaluate the reliability of the provided delivery dates, but found them adequate for our purposes of presenting the Bureau's current plans.

All of our work was previously performed, or is currently being conducted 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. The CEDCAP program, which began in October 2014, is intended to provide data collection and processing solutions (including

²GAO, *Decennial Census: Progress Report on Preparations for 2020*. GAO-17-238T (Washington, D.C.: Nov. 16, 2016).

³GAO, *Information Technology: Better Management of Interdependencies between Programs Supporting 2020 Census Is Needed*, GAO-16-623 (Washington, D.C.: Aug. 9, 2016).

systems, interfaces, platforms, and environments) to support the Bureau's multiple surveys throughout the survey life cycle (including survey design; instrument development; sample design and implementation; data collection; and data editing, imputation, and estimation). In October 2015, the Bureau estimated that, with its new approach, it expects to be able to conduct the 2020 Census for a life-cycle cost of \$12.5 billion, which would be a reduction of about \$5.2 billion from its estimate of what it would cost to repeat the design and methods of the 2010 Census.⁴ However, in June 2016, we reported that this \$12.5 billion cost estimate was not reliable and did not adequately account for risks that could affect the 2020 Census costs.⁵

In November 2015, the Bureau issued a 2020 Census Operational Plan, which is intended to outline the design decisions that are to drive how the 2020 Decennial Census will be conducted—and which are expected to dramatically change the Bureau's approach to conducting the 2020 Decennial Census.⁶ The plan identified 350 redesign decisions that the Bureau had either made or was planning to make through 2018. In August 2016, we reported that the Bureau had determined that about 51 percent of the design decisions were either IT-related or partially IT-related (84 IT-related and 94 partially IT-related).

As of October 2016, the Bureau reported that it had made 68 IT-related and 62 partially IT-related design decisions. For example, the Bureau had decided that individuals/households are to be able to respond to the census on the Internet from a computer, mobile device, or other devices that access the Internet; that it intends to award a contract to provide mobile phones and the accompanying service to enumerators; and that it plans to use a hybrid cloud solution where it is feasible.⁷ However, the

⁴Total savings compared to the Bureau's projected cost of the 2020 Census using the traditional approach and methods that were used in the 2010 Decennial Census (in 2020 constant dollars).

⁵2020 Census: Census Bureau Needs to Improve Its Life-Cycle Cost Estimating Process, GAO-16-628 (Washington, D.C.: June 30, 2016).

⁶The Bureau issued an updated version of the plan in September 2016.

⁷Cloud computing is a means for delivering computing services via IT networks. A hybrid cloud is one type of deployment model for providing cloud services that combines two or more other deployment models, such as private—set up specifically for one organization—and public—available to the general public and owned and operated by the service provider, and is bound together by standardized or proprietary technology.

Bureau acknowledged that it still needed to make 16 IT-related and 32 partially-IT related design decisions, including on (1) the uses of cloud-based solutions, such as whether it plans to use a cloud service provider to support a tool for assigning, controlling, tracking, and managing enumerators' caseloads in the field; (2) the tools and test materials to be used during integration testing; and (3) the expected scale of the system workload for those respondents that do not use the Bureau-provided Census identification.

To inform these design decisions, the Bureau held several major operational tests, including

- the 2014 Census test, which was conducted in the Maryland and Washington, D.C., areas to evaluate new methods for conducting self-response and non-response follow-up;
- the 2015 Census test in Arizona, which evaluated, among other things, (1) the use of a field operations management system to automate data collection operations and provide real-time data, (2) the ability to reduce the non-response follow-up workload using information previously provided to the government, and (3) the use of personally owned mobile devices by the field-based enumerators who go door to door to collect census data;
- the 2015 Optimizing Self-Response test in Savannah, Georgia, and the surrounding area, which was intended to explore methods of encouraging households to respond using the Internet, such as by using advertising and outreach to motivate respondents, and enabling households to respond without a Bureau-issued identification number; and
- the 2016 Census tests in Harris County, Texas and Los Angeles, California, which evaluated, among other things, the efficiency of non-response follow-up using contractor-provided mobile devices.

Looking forward, the Bureau has plans for two additional operational tests: (1) the 2017 Census test—a nationwide sample of how individuals respond to Census questions using paper, the Internet, or the phone—in order to evaluate key new IT components, such as the Internet self-

response system and the use of a cloud-based infrastructure;⁸ and (2) the 2018 end-to-end test, scheduled from August 2017 through December 2018, which, as previously mentioned, is to test all key systems and operations to ensure readiness for the 2020 Census.

Overview: The CEDCAP Program

The 2020 Decennial Census operations are dependent on about 50 IT systems that are currently being developed or are already in production. Eleven of these systems are expected to be provided as CEDCAP enterprise systems, which have the potential to offer numerous benefits to the Bureau's multiple survey programs, such as enabling an Internet response option; automating the assignment, control, and tracking of the caseloads of the field-based enumerators; and enabling a mobile data collection tool for field work. More details on each of the CEDCAP projects can be found in our June 2016 testimony and our August 2016 report.⁹

Our August 2016 report noted that the projects were at varying stages of planning and design, and none were in the implementation/deployment stage.¹⁰ The Bureau had previously developed several pilot systems to provide and test different capabilities, but in May 2016, decided that it would acquire the capabilities from a vendor, using a commercial-off-the-shelf IT platform, rather than continue to develop the capabilities in-house. This project is called the Enterprise Censuses and Surveys Enabling (ECASE) initiative. The capabilities that ECASE is to provide include key functionality intended to significantly redesign the 2020 Census and achieve efficiency gains, such as enabling an Internet response-option and an operational control system that automates the assignment, tracking, and management of enumerators' case work.

⁸The Bureau had originally planned to perform field tests in Puerto Rico, North and South Dakota, and Washington during the 2017 Census test, and to evaluate the use of handheld devices and applications. However, due to its concerns about the fiscal year 2017 budget, in October 2016, the Bureau decided to cancel the field portions of the 2017 Census test and its associated evaluation of information technology solutions.

⁹GAO, *Information Technology: Management of Interdependencies between Programs Supporting 2020 Census*, GAO-16-723T (Washington, D.C.: June 9, 2016); and GAO-16-623.

¹⁰GAO-16-623.

The Bureau does not have a firm estimate for the cost of the CEDCAP projects. In 2013, the CEDCAP program office estimated that the program would cost about \$548 million from 2015 to 2020. More recently, in July 2015, an independent cost estimate for CEDCAP projected the projects to cost about \$1.14 billion from 2015 to 2020. However, this July 2015 estimate was developed before the bureau decided to purchase rather than continue to build 6 of the CEDCAP capabilities.

Prior Efforts to Insert Information Technology in Decennial Census Programs Experienced Problems

As noted in our prior reports, the Bureau's past efforts to acquire and implement new approaches and systems have not always gone as planned. As one example, during the 2010 Census, the Bureau planned to use handheld mobile devices to support field data collection for the census, including following up with non-respondents.¹¹ However, due to significant problems identified during testing of the devices, as well as cost overruns and schedule slippages, the Bureau decided not to use the handheld devices for nonresponse follow-up. Instead, it reverted to paper-based processing, which increased the cost of the 2010 Census by up to \$3 billion and significantly increased the risk of not completing the Census on time. Due in part to these technology issues the Bureau was facing, we designated the 2010 Census a high-risk area in March 2008.¹²

Further, we testified in November 2015 that key IT decisions needed to be made soon because the Bureau was less than 2 years away from end-to-end testing of all systems and operations to ensure readiness for the 2020 Census, leaving limited time to implement the systems.¹³ We emphasized that the Bureau had deferred key IT-related decisions, and that it was running out of time to develop, acquire, and implement the systems it will need to deliver the redesigned operations.

¹¹GAO, *2010 Census: Preliminary Lessons Learned Highlight the Need for Fundamental Reforms*, GAO-11-496T (Washington, D.C.: Apr. 6, 2011); and *Information Technology: Census Bureau Testing of 2010 Decennial Systems Can Be Strengthened*, GAO-09-262 (Washington, D.C.: Mar. 5, 2009).

¹²GAO, *Information Technology: Significant Problems of Critical Automation Program Contribute to Risks Facing 2010 Census*, GAO-08-550T (Washington, D.C.: Mar. 5, 2008).

¹³GAO, *2020 Census: Key Information Technology Decisions Must Be Made Soon*, GAO-16-205T (Washington, D.C.: Nov. 3, 2015).

Government-wide Challenges Involving IT Acquisition and Operations

The Bureau is not alone in facing challenges in acquiring IT systems—it is a systemic issue that plagues the federal government. Although the executive branch has undertaken numerous initiatives to better manage the more than \$80 billion that is annually invested in IT, we have a significant body of work that has found that federal IT investments too frequently fail or incur cost overruns and schedule slippages while contributing little to mission-related outcomes. We have previously testified that the federal government has spent billions of dollars on failed IT investments, such as

- the Department of Defense's Expeditionary Combat Support System, which was canceled in December 2012, after spending more than a billion dollars and failing to deploy within 5 years of initially obligating funds;
- the Department of Veterans Affairs' Financial and Logistics Integrated Technology Enterprise program, which was intended to be delivered by 2014 at a total estimated cost of \$609 million, but was terminated in October 2011 due to challenges in managing the program; and
- the National Oceanic and Atmospheric Administration, Department of Defense, and the National Aeronautics and Space Administration's National Polar-orbiting Operational Environmental Satellite System, which was a tri-agency weather satellite program that was terminated in February 2010 after having spent 16 years and almost \$5 billion on the program, when a presidential task force decided to disband the system.

Our work has shown that these and other failed IT projects often suffered from a lack of disciplined and effective management, such as project planning, requirements definition, and program oversight and governance. In many instances, agencies have not consistently applied best practices that are critical to successfully acquiring IT investments, such as (1) program staff having the necessary knowledge and skills; (2) program staff prioritizing requirements; (3) end users participating in the testing of system functionality prior to end user acceptance testing; (4) government and contractor staff being stable and consistent; and (5) program officials maintaining regular communication with the prime contractor.

Due to the challenges of acquiring IT across the federal government, we added improving the management of IT acquisitions and best practices as

a key area in our 2015 High-Risk Report.¹⁴ As part of this new area, we also identified CEDCAP as one of nine programs across the federal government in need of the most attention.

The Bureau Lacks Processes for Effectively Managing Interdependencies between the CEDCAP and 2020 Census Programs

In August 2016, we reported that the CEDCAP and 2020 Census programs were intended to be on parallel implementation tracks and had major interdependencies; however, the interdependencies between these two programs had not always been effectively managed. Importantly, CEDCAP relies on 2020 Census to be one of the biggest consumers of its enterprise systems, and 2020 Census relies heavily on CEDCAP to deliver key systems to support its redesign.

Nevertheless, while both programs had taken a number of steps to coordinate, such as holding weekly schedule coordination meetings and participating in each other's risk review board meetings, the two programs lacked processes for effectively integrating their schedule dependencies, integrating the management of interrelated risks, and managing requirements. Specifically:

- the CEDCAP and 2020 Census programs did not have an effective process for integrating schedule dependencies. Best practices identified in our Schedule Assessment Guide call for dependencies between two programs to be automatically linked and dynamically responsive to change, or handled through a defined repeatable process if manual reconciliation cannot be avoided.¹⁵ We reported that the CEDCAP and 2020 Census programs had both established master schedules that contain thousands of milestones and tens of thousands of activities and had identified major milestones within each program that were intended to align with each other. However,

¹⁴Every 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. See GAO, *High-Risk Series: An Update*, GAO-15-290 (Washington, D.C.: Feb. 11, 2015).

¹⁵GAO-16-89G.

the CEDCAP and 2020 Census programs maintained their master schedules using different software where dependencies between the two programs were not automatically linked, were not dynamically responsive to change, and not handled through a defined repeatable process. Instead, the Bureau's practice of maintaining separate dependency schedules, which must be manually reconciled, had proven to be ineffective and had contributed to the misalignment between the programs' schedules. We concluded in our report that, without an effective process for ensuring alignment between the two programs, the Bureau faces increased risk that capabilities for carrying out the 2020 Census will not be delivered as intended. Thus, we recommended that the Bureau define, document, and implement a repeatable process to establish complete alignment between the CEDCAP and 2020 Census programs by, for example, maintaining a single dependency schedule. The Bureau agreed with this recommendation and indicated it would be taking actions to address it.

- CEDCAP and 2020 Census did not have an integrated list of risks facing both programs. We reported that the two programs had taken steps to collaborate on identifying and mitigating risks, such as having processes in place for identifying and mitigating risks that affect their respective programs. However, we found that these programs did not have an integrated list of risks (referred to as a risk register) with agreed-upon roles and responsibilities for tracking them, as called for by best practices identified by GAO for collaboration and leading practices in risk management. This decentralized approach introduced two key challenges: (1) there were inconsistencies in tracking and managing interdependent risks, and (2) tracking risks in two different registers could result in redundant efforts and potentially conflicting mitigation efforts. To address this, we recommended that the Bureau establish a comprehensive and integrated list of all interdependent risks facing the CEDCAP and 2020 Census programs, and clearly identify roles and responsibilities for managing this list. The Bureau agreed with this recommendation and indicated it would take actions to address it.
- Among other requirements management challenges, we reported that although the Bureau had drafted a process for managing requirements between CEDCAP and 2020 Census programs, the process had not yet been finalized. As a result, the Bureau had developed three system releases without having a fully documented and institutionalized process for collecting those requirements. In July 2016, Bureau officials stated that, due to the recent selection of a

commercial vendor to deliver many of the CEDCAP capabilities, they did not plan to finalize this process until January 2017. We made three recommendations to the Bureau to strengthen its requirements management processes. The Bureau agreed with these recommendations and reported that it planned to take actions to address them.

Census Bureau Faces Several Information Security Challenges in Implementing the 2020 Census

While the Bureau plans to extensively use IT systems to support the 2020 Census redesign in an effort to realize potentially significant efficiency gains and cost savings, we reported that this redesign introduces critical information security challenges related to the following:

- minimizing the threat of phishing aimed at stealing personal information, which could target 2020 Census respondents, as well as Census employees and contractors;¹⁶
- ensuring that individuals gain only limited and appropriate access to 2020 Census data;
- adequately protecting approximately 300,000 mobile devices;
- ensuring adequate control of security performance requirements in a cloud environment, such as those related to data reliability, preservation, privacy, and access rights;
- adequately considering information security when making decisions about the IT solutions and infrastructure supporting the 2020 Census;
- making certain that key IT positions are filled and have appropriate information security knowledge and expertise;
- ensuring that contingency and incident response plans are in place that encompass all of the IT systems to be used to support the 2020 Census;
- adequately training Bureau employees, including its massive temporary workforce, in information security awareness;
- making certain that security assessments are completed in a timely manner and that risks are at an acceptable level; and

¹⁶Phishing is a digital form of social engineering that uses authentic-looking, but fake, e-mails, websites, or instant messages to get users to download malware, open malicious attachments, or open links that direct them to a website that requests information or executes malicious code.

-
- properly configuring and patching systems supporting the 2020 Census.

For example, the introduction of an option for households to respond using the Internet puts respondents more at risk for phishing attacks (requests for information from authentic-looking, but fake, e-mails and websites). In addition, because the Bureau plans to provide its enumerators with mobile devices to collect information from households that did not self-respond to the survey, it is important that the Bureau ensures that these devices are adequately protected. More details on each of these challenges can be found in our recently issued report.¹⁷

In early 2016, the Bureau's acting Chief Information Officer and its Chief Information Security Officer acknowledged these challenges and described the Bureau's plans to address them. For example, the Bureau has developed a risk management framework, intended to ensure that proper security controls are in place and provide authorizing officials with details on residual risks and progress to address those risks. To minimize the risk of phishing, Bureau officials noted that they plan to contract with a company to monitor the Internet for fraudulent sites pretending to be those of the Census Bureau. Continued focus on these considerable challenges will be important as the Bureau begins to develop and/or acquire systems and implement the 2020 design.

Uncertainty about the Bureau's Readiness for the 2018 Test Remains

Looking forward, there is uncertainty as to whether the Census Bureau will be ready for the 2018 end-to-end test. We have ongoing work for this Committee that is evaluating the significant challenges the Bureau faces in developing, testing, and integrating systems prior to the 2018 test. Among other things, we plan to address the following key questions:

- **Is the Bureau sufficiently prepared to complete the development, testing, and integration of all of the systems and infrastructure in time for the end-to-end test?** There are less than 9 months before the 2018 test is scheduled to begin, but a great deal of development work remains to be completed and the Bureau is still developing the

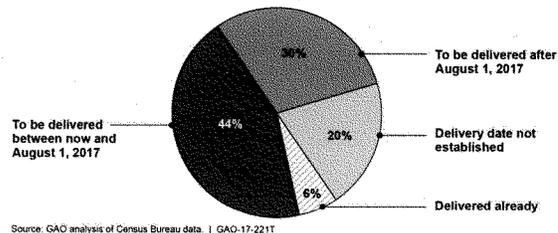
¹⁷GAO-16-623.

plans and schedules leading up to the 2018 test. For example, as of October 2016, only 3 of the 50 systems (6 percent) had been delivered. The other 47 systems that the Bureau plans to use during the 2018 end-to-end test were in various forms of development, including:

- 22 systems (or 44 percent) that were expected to be delivered by the time the 2018 end-to-end test begins;
- 15 systems (or 30 percent) that were expected to be delivered after the 2018 end-to-end test begins; and
- 10 systems (or 20 percent) that did not have firm delivery dates.

Figure 1 depicts the percentage of systems that have been delivered, are scheduled before and after August 1, 2017, and that have not yet been firmly scheduled for delivery.¹⁸

Figure 1: Expected Delivery Dates for the Systems for the 2018 End-to-End Test (as of October 2016)



In addition, the Bureau has not identified the entire infrastructure (i.e., cloud solutions and/or data centers) that it plans to use for the 2018 test or 2020 operations and, as of October 2016, it did not yet have a time frame for the implementation of the infrastructure.

- **Is the Bureau effectively managing its significant contractor support?** The Bureau is relying on contractor support in many key

¹⁸While some systems will not be needed by August 1, 2017, they will be needed soon after that date for training purposes.

areas, including the technical integration of all of the key systems and infrastructure, and the development of many of the data collection systems. For example, in August 2016, the Bureau awarded a contract for the technical integration of the 2020 Census systems and infrastructure, to include an evaluation of the systems and infrastructure, development of the infrastructure (e.g., cloud or data center) to meet the Bureau's scalability and performance needs, integration of all of the systems, and support for testing activities. However, key dates for this work have yet not been finalized.

In addition, the Bureau is relying on other contractors to develop a number of key systems, such as (1) development of the IT platform that will be used to collect data from a majority of respondents—through the use of the Internet, telephone, and non-response follow-up activities; (2) procurement of the mobile devices and cellular service to be used for non-response follow-up; and (3) development of the IT infrastructure in the field offices. The 2020 Census will be the first time that the Bureau uses a technical integrator in this manner; collects data nationwide via the Internet; and relies on mobile devices for non-response follow-up. A greater reliance on contractors for these key components of the 2020 Census requires the Bureau to focus on sound management and oversight of the key contracts, projects, and systems.

- **Does the Bureau have back-up plans in case key systems are not ready in time for the 2018 test?** The 2017 Census Test (with a Census Day of April 1, 2017) will be the first time that the Bureau has an opportunity to test various IT systems and infrastructure in operation, including the Internet response system and the system to be used for phone responses. However, because the Bureau is revising its plans for the 2017 test, it has not yet determined whether or how it will test other systems and features prior to the end-to-end test, such as the mobile devices that the enumerator's will use to record and upload household information and whether these systems can handle a nationwide scope. Uncertainty about what will be included in the 2017 test has the potential to add risk to the 2018 end-to-end test, and it will be important for the Bureau to make plans in case key systems are not ready in time for the 2018 test.
- **Can the Bureau adequately secure the systems and data, and respond to breaches should they occur?** As described previously, the Bureau faces significant challenges in securing systems and data, and tight time frames can exacerbate those challenges. Because many of the systems to be used in the 2018 end-to-end test are not

yet fully developed, the Bureau has not finalized all of the controls to be implemented, completed an assessment of those controls, developed plans to remediate any control weaknesses, and determined whether there is time to fully remediate any weaknesses before the system test begins.

We are continuing to evaluate these and other important areas related to the Bureau's efforts to ensure its systems are ready for the 2020 Decennial Census.

In summary, the CEDCAP program has the potential to offer numerous benefits to the Bureau's multiple survey programs, including the 2020 Census program. While the Bureau had taken steps to implement CEDCAP projects, considerable work remains for its production systems to be in place to support the 2020 Census end-to-end system integration test—which is to occur in less than a year. Given the numerous and critical dependencies between the CEDCAP and 2020 Census programs, their parallel implementation tracks, and the 2020 Census' immovable deadline, it is imperative that the interdependencies between these programs be effectively managed.

Implementation of our recommendations to, among other things, use a repeatable process to establish complete alignment between the programs; establish an integrated list of all interdependent risks facing the programs; and strengthen the programs' processes for requirements management would help align the programs and better ensure that the efficiency and effectiveness goals of the 2020 Census redesign are achieved.

Additionally, while the large-scale technological changes for the 2020 Decennial Census introduce great potential for efficiency and effectiveness gains, it also introduces many information security challenges, including educating the public to offset inevitable phishing scams. Continued focus on these considerable security challenges will be important as the Bureau begins to develop and/or acquire systems and implement the 2020 Census design.

In our ongoing work for this Committee, we plan to address key questions about the Bureau's ability to develop, integrate, test, and secure the IT systems and infrastructure in time for the end-to-end test. Given the short window of time before the test begins, it is important that the Bureau continue to focus its attention on implementing and securing the systems that will collect and store the personal information of millions of American people.

Chairman Meadows, Ranking Member Connolly, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions that you may have.

Contact and Acknowledgments

If you have any questions concerning this statement, please contact David A. Powner at (202) 512-9286 or pownerd@gao.gov. GAO staff who made key contributions to this testimony are Carol Harris (Director), Colleen Phillips (Assistant Director), Shannin G. O'Neill (Assistant Director), Kate Sharkey (Analyst in Charge), Andrew Beggs, Chris Businsky, Juana Collymore, Becca Eyler, Lee McCracken, Andrea Starosciak, Jeanne Sung, Umesh Thakkar.

Mr. MEADOWS. Thank you so much.
Mr. Goldenkoff, you are recognized for 5 minutes.

STATEMENT OF ROBERT GOLDENKOFF

Mr. GOLDENKOFF. Chairman Meadows, Ranking Member Connolly, and members of the subcommittee, thank you for the opportunity to be here today to discuss the Census Bureau's preparations for the 2020 Census.

As you know, to help control costs and maintain the accuracy of the next enumeration, the Bureau is planning to employ new procedures and technology that have not been used to a large degree in prior decennials, if at all. While the Bureau estimates that its planned innovations can save as much as \$5.2 billion compared to a repeat of the approach it used in 2020, those same innovations also introduce new risks.

As a result, it will be important to thoroughly test the operations plan for 2020 to help ensure that they will produce needed cost savings, function in concert with other census operations, and work at the scale needed for the national head count. The Bureau's failure to fully test some key operations prior to the 2010 Census was a key factor that led us to designate the 2010 Decennial a GAO high-risk area.

In my remarks today, I will provide some preliminary observations on two such tests occurring this year: the Bureau's test of nonresponse follow-up operations in Los Angeles County, California, and Harris County, Texas, and the ongoing test of address canvassing procedures in Buncombe County, North Carolina, and in St. Louis, Missouri. I will also discuss some key lessons learned from the 2010 Census that can be applied to the Bureau's preparations for 2020.

The 2016 test of nonresponse follow-up operations where enumerators visited households that did not respond to the census generally proceeded according to the Bureau's operational plans. However, preliminary data at both the Harris County and L.A. Test sites indicate that the Bureau experienced a large number of non-interviews, as much as 30 percent of the workload, where either no or insufficient data were collected. Bureau officials are not certain why there were so many non-interviews and are researching the potential causes.

Going forward, it will be important for the Bureau to identify and address the factors that contributed to the non-interview rate, as they could have implications for the cost and accuracy of the final population count.

Our preliminary observations also revealed that refining some key enumeration procedures could produce additional efficiencies by enabling the Bureau to be more responsive to situations enumerators encounter on the ground. These refinements include providing more flexible access to recently closed, incomplete cases, improving communication with managers of multi-unit properties to better coordinate enumerators' visits, and improving the ability to update the automated case management system with information on the best time of day to visit households.

Meanwhile, in Buncombe County, North Carolina, and in St. Louis, Missouri, the Bureau is testing new procedures for building

its master address list for 2020. The Bureau plans to employ aerial imagery, street imagery, and address file data from State, local, and tribal partners to update address and map information. The goal is to limit the more expensive and traditional door-to-door address canvassing only to those areas most in need of updating, such as areas with recent housing growth. The Bureau anticipates that by using this new or targeted approach, just 25 percent of housing units will require field canvassing.

While this initiative shows promise for controlling cost, the Bureau has identified a series of risks that could affect its cost or quality. These risks include, for example, locating hidden housing units, such as converted garages and basements, and monitoring changes in housing stocks.

In summary, while the Bureau has made considerable progress in developing more cost-effective enumeration procedures, a number of risks and uncertainties remain and key lessons learned in planning for the 2010 head count can enhance the Bureau's readiness for 2020.

Based on our prior work, these lessons include ensuring key census activities are fully tested, developing and managing the enumeration on a basis of reliable cost estimates, and sustaining workforce planning efforts to ensure the Bureau has the optimal mix of skills to cost effectively conduct the enumeration.

Chairman Meadows, Ranking Member Connolly, this concludes my remarks. I would be pleased to respond to any questions that you or other members of the subcommittee might have.

[Prepared statement of Mr. Goldenkoff follows:]

United States Government Accountability Office



Testimony
Before the Subcommittee on
Government Operations, Committee on
Oversight and Government Reform,
House of Representatives

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DECENNIAL CENSUS

Progress Report on Preparations for 2020

Statement of Robert Goldenkoff
Director
Strategic Issues

GAO Highlights

Highlights of GAO-17-238T, a testimony to the Subcommittee on Government Operations, Committee on Oversight and Government Reform, House of Representatives

Why GAO Did This Study

With a life-cycle cost of about \$12.3 billion, the 2010 Census was the most expensive U.S. census in history. To help control costs and maintain accuracy, the 2020 Census design includes new procedures and technology that have not been used extensively in earlier decennials, if at all. While these innovations show promise for a more cost-effective head count, they also introduce risks. As a result, it is important to thoroughly test the operations planned for 2020. This testimony focuses on (1) the preliminary results to date of the Bureau's 2016 Census Test in Los Angeles County, California, and Harris County, Texas; (2) the Bureau's plans for the upcoming test of address canvassing procedures in Buncombe County, North Carolina, and St. Louis, Missouri; and (3) the lessons learned from the 2010 Census that can be applied to preparations for 2020.

This testimony is based on GAO's ongoing reviews of the 2016 Census Test and Address Canvassing Test. For these studies, GAO reviewed Bureau documents and preliminary data, interviewed Bureau officials, and made site visits to observe census operations. This testimony is also based on prior GAO work on lessons learned from the 2010 Census.

What GAO Recommends

GAO has made several recommendations to the Census Bureau in prior reports on cost estimation and workforce planning. The Bureau has implemented the workforce planning recommendations, and agreed with and plans to implement the cost estimation recommendations.

View GAO-17-238T. For more information, contact Robert Goldenkoff at (202) 512-2757 or goldenkoff@gao.gov.

November 16, 2016

DECENNIAL CENSUS

Progress Report on Preparations for 2020

What GAO Found

GAO preliminarily found that during the 2016 Census Test, nonresponse follow-up (NRFU), where enumerators visit households that did not respond to the census, generally proceeded according to the Census Bureau's (Bureau) operational plans. However, data at both test sites indicate that the Bureau experienced a large number of non-interviews. The Bureau considers non-interviews to be cases where either no data or insufficient data are collected. Bureau officials are not certain why there were so many non-interviews for the test and are researching potential causes. In addition, the Bureau's plan to automate the assignment of NRFU cases to enumerators has the potential to deliver significant efficiency gains as compared to paper-based operations conducted in previous decennial censuses, according to the Bureau. GAO preliminarily found that improvements to certain enumeration procedures and better training could produce additional efficiencies by enabling the Bureau to be more responsive to situations enumerators encounter on the ground. These improvements include providing more flexible access to recently closed, incomplete cases, enumerator interview training with multi-unit property managers, and operational procedures to make use of local data on the best time to attempt interviews.

The Bureau has reengineered its approach to building its master address list for 2020 in part by introducing a two-phase "in-office" process that systematically reviews small geographic areas nationwide. The goal is to limit the more expensive and traditional door-to-door canvassing to those areas most in need of updating, such as areas with recent housing growth. The in-office phases rely on aerial imagery, street imagery, geographic information systems and address file data from state, local, and tribal partners. The Bureau estimates that the new process will result in about 25 percent of housing units requiring field canvassing compared to the traditional process where all housing units were canvassed. The Bureau has identified a series of risks that could affect the cost or quality of the address canvassing operation, including locating hidden housing units such as converted garages, monitoring change in housing stock, and obtaining quality data. The Bureau is testing its reengineered address canvassing operation in two sites through December 2016—in Buncombe County, North Carolina, and St. Louis.

The Bureau's experience in planning for the 2010 decennial can enhance its readiness for 2020. Going forward, GAO's prior work indicates it will be important for the Bureau to address several key lessons learned, including: (1) ensuring key census-taking activities are fully tested, (2) developing and managing on the basis of reliable cost estimates, and (3) sustaining workforce planning efforts to ensure it has the optimal mix of skills to cost-effectively conduct the enumeration.

Chairman Meadows, Ranking Member Connolly, and Members of the Subcommittee:

I am pleased to be here today to discuss the progress of the U.S. Census Bureau's (Bureau) preparations for the 2020 Census. As requested, my remarks will focus on (1) the preliminary results to date of the Bureau's 2016 Census Test in Los Angeles (L.A.) County, California, and Harris County, Texas; (2) the status of the Bureau's test of address canvassing procedures in Buncombe County, North Carolina, and St. Louis, Missouri; and (3) the lessons learned from the 2010 Census that can be applied to the Bureau's preparations for 2020. In his statement today, my colleague will discuss the Bureau's approach to deliver an enterprise information technology initiative, and to ensure the integrity and security of systems and data in support of the 2020 Census.¹ We anticipate issuing a report on the Bureau's 2016 test early in the new year.

Sufficient testing, while important to the success of any census, is even more critical for the Bureau's preparations for 2020. To help control costs and maintain accuracy, the 2020 Census design includes new procedures and technology that have not been used extensively in earlier decennials, if at all. While these innovations show promise for a more cost-effective head count, they also introduce new risks. As we have noted in our prior work, it will be important to thoroughly test the operations planned for 2020 to ensure they will (1) produce needed cost savings, (2) function in concert with other census operations, and (3) work at the scale needed for the national head count.² The Bureau's failure to fully test some key operations prior to the 2010 Census was a key factor that led us to designate that decennial as one of our high-risk areas.

A key objective of the 2016 Census Test in Harris and L.A. Counties was to refine the methodology for nonresponse follow-up (NRFU), where enumerators personally visit households that do not self-respond to the census. NRFU is the largest and costliest of all census-taking activities because it is so labor intensive. The Bureau selected Harris and L.A. counties as test sites for several reasons including language diversity,

¹GAO, *Information Technology: Uncertainty Remains about the Bureau's Readiness for the Decennial Census*, GAO-17-221T (Washington, D.C.: Nov. 16, 2016).

²GAO, *2020 Census: Progress Report on the Census Bureau's Efforts to Contain Enumeration Costs*, GAO-13-857T (Washington, D.C.: Sept. 11, 2013).

demographic diversity, high vacancy rates, and varying levels of Internet usage. There are around 225,000 housing units in each test area. The Bureau estimates that re-engineering its field procedures could save as much as \$2.5 billion.

In conducting the 2016 Address Canvassing Test, which began in August 2016, the Bureau is to measure the effectiveness of new procedures for building its address list. Buncombe County, North Carolina, is a mix of urban, suburban, and rural territories while St. Louis is a principal city. Accurate addresses and precise maps are critical for the census, in part because census data are used for congressional apportionment, 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 geography.

For 2020, the Bureau plans to target its traditional or "in-field" canvassing efforts to those areas most in need of updating such as those that have experienced rapid recent housing development and for which the Bureau has no data sources capturing those changes. The Bureau will rely on "in-office" procedures to update the majority of addresses in the country. These procedures include validating addresses through aerial imagery and by using data from the U.S. Postal Service as well as from state, local, and tribal governments. The Bureau estimates it will save up to \$1 billion with the successful implementation of this initiative.

My testimony is based on our ongoing reviews of the 2016 Census Test and Address Canvassing Test. For these studies, we reviewed Bureau documents and preliminary data, interviewed local and headquarters Bureau officials, and for the 2016 Census Test, made several site visits to Los Angeles and Harris Counties to observe NRFU procedures. For the Address Canvassing Test, we made site visits to Buncombe County, North Carolina and St. Louis to observe in-field address canvassing procedures and to the Bureau's National Processing Center in Jeffersonville, Indiana to observe in-office canvassing. These observations are not generalizable. On September 16, 2016, we shared the information included in this statement with the Census Bureau for its review. On September 21, 2016, we met with Bureau officials and they provided technical comments which we included, as appropriate. My testimony is also based on our prior work on the Bureau's preparations for 2020, as well as our work on lessons learned from the conduct of the 2010 Census. For those studies, we reviewed Bureau planning documents and test plans, interviewed Bureau officials, and made site

visits to observe how census operations were being implemented in the field.³

The work on which this statement is based was conducted 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

With a cost of about \$12.3 billion, the 2010 Census was the most expensive population count in U.S. history, costing about 31 percent more than the \$9.4 billion 2000 Census (in constant 2020 dollars). Some cost growth is to be expected because the population is growing and becoming more complex and difficult to count, which increases the Bureau's workload. However, the cost of counting each housing unit has escalated from about \$16 in 1970 to \$92 in 2010 (in constant 2020 dollars), according to the Bureau.

For the 2020 Census, the Bureau intends to limit its per-household cost to not more than that of the 2010 Census, adjusted for inflation. To achieve this goal, the Bureau is significantly changing how it conducts the census, in part by re-engineering key census-taking methods and infrastructure. The Bureau's innovations include (1) using the Internet as a self-response option; (2) verifying most addresses using "in-office" procedures rather than costly field canvassing; (3) re-engineering data collection methods; and (4) in certain instances, replacing enumerator-collected data with administrative records (information already provided to federal and state governments as they administer other programs).

The Bureau's various initiatives have the potential to reduce costs. In October 2015, the Bureau estimated that with its new approach it can

³See for example: GAO, *2020 Census: Recommended Actions Need to Be Implemented before Potential Cost Savings Can be Realized*, GAO-15-546T (Washington, D.C.: April 20, 2015); GAO, *2020 Census: Progress Report on the Census Bureau's Efforts to Contain Enumeration Costs*, GAO-13-857T (Washington, D.C.: Sep. 11, 2013); and GAO, *Preliminary Lessons Learned Highlight the Need for Fundamental Reforms*, GAO-11-496T (Washington, D.C.: April 6, 2011).

conduct the 2020 Census for a life-cycle cost of \$12.5 billion, \$5.2 billion less than if it were to repeat the design and methods of the 2010 Census (both in constant 2020 dollars). However, in June 2016, we reported that this \$12.5 billion cost estimate was not reliable and did not adequately account for risk.⁴ Table 1 below shows the Bureau's estimated cost savings it hopes to achieve in the following four innovation areas.

Table 1: The Census Bureau's Cost Estimates Show Redesign to Cost Less Than Traditional Census

Key design area	October 2015 estimated savings (in 2020 constant dollars)
Reengineering address canvassing	\$900 million
Optimizing self-response	400 million
Using administrative records	1.4 billion
Reengineering field operations	2.5 billion
Total savings compared to Bureau's projected cost of 2020 Census using traditional approach and methods	\$5.2 billion

Source: GAO analysis of U.S. Census Bureau data. | GAO-17-238T

The 2016 test was the latest major test of NRFU in the Bureau's testing program. In 2014, the Bureau tested new methods for conducting NRFU in the Maryland and Washington, D.C., area. In 2015, the Bureau assessed NRFU operations, in Maricopa County, Arizona. In 2018, the Bureau plans to conduct a final "End-to-End" test which is essentially a dress rehearsal for the actual decennial. The Bureau needs to finalize the census design by the end of fiscal year 2017 so that key activities can be included in the End-to-End Test.

The Bureau plans to conduct additional research through 2018 in order to further refine the design of the 2020 Census, but recently had to alter its approach. On October 18, 2016, the Bureau decided to stop two field test operations planned for fiscal year 2017 in order to mitigate risks from funding uncertainty. Specifically, the Bureau said it would stop all planned field activity, including local outreach and hiring, at its test sites in Puerto Rico, North and South Dakota, and Washington State. The Bureau will

⁴GAO, *2020 Census: Census Bureau Needs to Improve Its Life-Cycle Cost Estimating Process*, GAO-16-628 (Washington, D.C.: June 30, 2016).

not carry out planned field tests of its mail-out strategy and follow up for non-response in Puerto Rico, or its door-to-door enumeration. The Bureau also cancelled plans to update its address list in the Indian lands and surrounding areas in the three states.

However, the Bureau will continue with other planned testing in fiscal year 2017, such as those focusing on systems readiness and internet response. Further, the Bureau said it would consider incorporating the cancelled field activities elements within the 2018 End-to-End Test. The Bureau maintains that stopping the 2017 Field Test will help prioritize readiness for the 2018 End-to-End Test, and mitigate risk. Nevertheless it also represents a lost opportunity to test, refine, and integrate operations and systems, and puts more pressure on the 2018 Test to demonstrate that enumeration activities will function as needed for 2020.

2016 Census Test Highlighted NRFU Challenges

NRFU generally proceeded according to the Bureau's operational plans. However, our observations and the Bureau's preliminary data at both test sites found that (1) there were a large number of non-interviews, and (2) enumerators had difficulty implementing new census-taking procedures.

The Bureau's 2016 Census Test included a new field management structure that, among other things, included an enhanced operations control system supporting daily assignments of cases. A cornerstone of the Bureau's efforts to reduce the cost of NRFU is the automation of decision-making on how to manage the follow-up caseload. Unlike previous censuses and one prior test, enumerators in the 2016 Census Test did not have an assigned set of cases that they alone would work until completion. Instead, the Bureau relied on an enhanced operational control system that was designed to provide daily assignments and street routing of non-response follow-up cases to enumerators in the most optimal and efficient way.⁵ The Bureau first tested this system in the 2015 Census Test. The test also included streamlined procedures for making contact at large apartment buildings. This was intended to reduce repeated attempts to contact property managers.

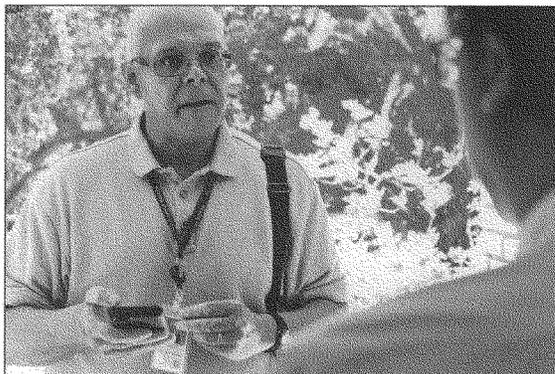
A key objective of the 2016 Census Test was to refine procedures for collecting NRFU data from households using mobile devices leased from

⁵The Bureau is currently developing the operational control system for the 2020 Census to replace the prototype system used for the 2016 Census Test.

a contractor. In prior decennials, enumerators collected NRFU information using paper and pencil. The Bureau believes that replacing paper-based operations with automated case management and mobile devices for collecting interview data will provide a faster, more accurate, and more secure means of data collection in the 2020 Census (see figure 1).

Some test activities that we observed at both test sites included streamlined multi-unit contact procedures and interviews with a proxy respondent. A proxy is someone who is a non-household member, at least 15 years old, and knowledgeable about the NRFU address. At multi-unit structures such as apartment buildings, the enumerator is trained to first interview the property manager to find out which units were occupied and which were vacant on Census Day. Such interviews help to streamline NRFU by removing vacant units from an enumerator's workload. They also help build a rapport with property managers by ensuring they know when enumerators are working in their building and can also help them gain access to locked buildings.

Figure 1: An Enumerator Using a Mobile Device to Collect Data from a Household Member During NRFU



Source: Census Bureau. | GAO-17-238T

The Bureau Needs to Better Understand Factors Contributing to NRFU Non-interviews

Preliminary data at both test sites indicate that the Bureau experienced a large number of non-interviews. According to the Bureau, non-interviews are cases where either no data or insufficient data were collected, in part because the cases reached the maximum number of six attempted visits without success or were not completed due to, for example, language barriers or dangerous situations.⁶ While not necessarily a precursor to the 2020 non-interview rate, because of its relationship to the cost and quality of the count, it will be important for the Bureau to better understand the factors contributing to it.

According to preliminary 2016 Census Test data, there were 19,721 NRFU cases coded as non-interviews in Harris County, Texas and 14,026 in Los Angeles County, California, or about 30 and 20 percent of the test workload respectively. In such cases, the Bureau may have to impute attributes of the household based on the demographic characteristics of surrounding housing units as well as administrative records.⁷

Bureau officials expect higher numbers of non-interviews during tests in part because, compared to the actual enumeration, the Bureau conducts less outreach and promotion. Bureau officials hypothesized that another contributing factor could be related to NRFU methods used in the 2016 test compared to earlier decennials. For the 2010 and earlier decennials, enumerators collected information during NRFU using pencil and paper. Enumerators may have visited a housing unit more than the 6 maximum allowable visits to obtain an interview but did not record all of their attempts, thus enabling them to achieve a higher completion rate. For the 2020 Census, and as tested in 2016, the Bureau plans to collect data

⁶According to the Bureau, it needs to collect on a number of pre-defined specific combinations of data elements during field interviews in order to consider the interview complete.

⁷The Bureau plans to use administrative records in at least two ways to help with counts for non-responding households. First, for households the Bureau has determined in advance of NRFU that administrative records for the household are good enough, the Bureau plans to use administrative records to count the household after one unsuccessful attempt knocking on their door. Second, for households with "non-interviews" after all follow-up operations are completed, the Bureau plans to use administrative records to help improve imputation of three related types of data the Bureau fills in for these housing units. These data fields include (1) whether or not a unit is occupied, (2) what the count of the unit might be, and (3) the demographic characteristics of the residents. The Bureau has not decided exactly how it will perform imputations for the 2020 Census or on what data its imputations will rely.

using mobile devices leased from a contractor, and an automated case management system to manage each household visit. The Bureau believes that this approach will provide a faster, more accurate, and more secure means of data collection. At the same time, the mobile device and automated case management system did not allow an enumerator to attempt to visit a housing unit more than once per day, reopen a closed case, or exceed the maximum allowable six attempts.

One factor we observed that may have contributed to the non-interview rate was that enumerators did not seem to uniformly understand nor follow procedures for completing interviews with proxy respondents. According to the 2016 Census Test enumerator training manual, when an eligible respondent at the address cannot be located, the automated case management system on the mobile device will prompt the enumerator when to find a proxy to interview, such as when no one is home or the housing unit appears vacant.⁸ In such circumstances, enumerators are to find a neighbor or landlord to interview. However, in the course of our site visits, we observed that enumerators did not always follow these procedures. For example, one enumerator, when prompted to find a proxy, looked to the left and then right and, finding no one, closed the case. Similarly, another enumerator ignored the prompt to find a proxy and explained that neighbors are usually not responsive or willing to provide information about the neighbor, and did not seek to find a proxy. Enumerators we interviewed did not seem to understand the importance of obtaining a successful proxy interview, and many appeared to have received little encouragement during training to put in the effort to find a proxy.

Proxy data for occupied households are important to the success of the census as the alternative is a non-interview. In 2010, about one-fourth of the NRFU interviews for occupied housing units were conducted using proxy data. We shared our observations with Bureau officials who told us that they are aware that enumerator training for proxies needs to be revised to convey the importance of collecting proxy data when necessary. Converting non-interviews by collecting respondent or proxy data can improve interview completion rates, and ultimately the quality of

⁸According to the test design, enumerators were prompted to locate a proxy after a third failed attempt to obtain a follow-up interview at a given housing unit.

Enumerators Faced Challenges Implementing New Procedures

census data. The Bureau told us it will continue to refine procedures for 2020.

According to the Bureau, its plans to automate the assignment of NRFU cases have the potential to deliver significant efficiency gains. At the same time, refinements to certain enumeration procedures and better communication could produce additional efficiencies by enabling the Bureau to be more responsive to situations enumerators encounter in the course of their follow-up work.

Enumerators were unable to access recently closed incomplete cases. Under current procedures, if an enumerator is unable to make contact with a household member, the case management system closes that case and it is to be reattempted at a later date, perhaps by a different enumerator, assuming the enumerator has not exceeded six attempts. Decisions on when reattempts will be made—and by whom—are automated and not designed to be responsive to the immediate circumstances on the ground. This is in contrast to earlier decennials when enumerators, using paper-based data collection procedures, had discretion and control over when to re-attempt cases in the area where they were working. According to the Bureau, leaving cases open for re-attempts can undermine the efficiency gains of automation when enumerators depart significantly from their optimized route, circling back needlessly to previously attempted cases rather than progressing through their scheduled workload.

During our test site observations, however, we preliminarily found how this approach could lead to inefficiencies in certain circumstances. For example, we observed enumerators start their NRFU visits in the early afternoon as scheduled, when many people are out working or are otherwise away. If no one answered the door, those cases were closed for the day and reassigned later. However, if a household member returned while the enumerator was still around, the enumerator could not reopen the case and attempt an interview. We saw this at both test site locations, typically in apartment buildings or at apartment-style gated communities, where enumerators had clear visibility to a large number of housing units and could easily see people arriving home.

Bureau officials acknowledged that closing cases in this fashion represented a missed opportunity and plan to test greater flexibilities as part of the 2018 End-to-End Test. Programming some flexibility into the mobile device—if accompanied with adequate training on how and when to use it—should permit completion of some interviews without having to

deploy staff to the same case on subsequent days. This in turn could reduce the cost of follow-up attempts and improve interview completion rates.

Enumerators did not understand procedures for visits to property managers. Property managers are a key source of information on non-respondents when enumerators cannot find people at home. They can also facilitate access to locked buildings. Further, developing a rapport with property managers has helped the NRFU process, such as when repeated access to a secured building or residential complex is needed on subsequent days by different enumerators.

In response to problems observed during the Bureau's 2014 and 2015 Census tests and complaints from property managers about multiple uncoordinated visits by enumerators, the Bureau's 2016 Census Test introduced specific procedures to conduct initial visits to property managers in large multi-unit apartment buildings. The procedures sought to identify up front which, if any, units needing follow-up at the location were vacant, eliminating the need for enumerators to collect this information from property managers with subsequent visits on a case-by-case basis. According to Bureau officials, the automated case management system was designed to allow for an enumerator to make up to three visits to property managers to remove vacant units.

According to the Bureau, the 2016 Census Test demonstrated that vacant units could quickly be removed from the NRFU workload using these procedures in cases where a property manager was readily available; however, in other cases the procedures caused confusion. For example, whenever an initial visit was unsuccessful, all of the cases at that location—up until then collated into only one summary row of the enumerator's on-screen case list—would suddenly expand and appear as individual cases to be worked, sometimes adding several screens and dozens of cases to the length of the list, which enumerators we spoke with found confusing. Furthermore, without the knowledge of which units were vacant, enumerators may have unnecessarily made visits to these units and increased the cost and the time required to complete NRFU .

During debriefing sessions the Bureau held, Bureau enumerators and their supervisors identified training in these procedures as an area they felt needed greater attention in the future. Indeed, while training classes included a case study exercise on interviewing a property manager, this exercise in the enumerators training manual gives no warning to enumerators and does not refer to the procedures. Bureau officials said

that they are pleased with the progress the test demonstrates they have made in automating case management at multi-unit locations a priority. They added that they recognize the need to better integrate procedures in the training moving forward.

Timing of return visits did not leverage information on respondent availability. During our field visits, we encountered several instances where enumerators had been told by a respondent or otherwise learned that returning at a specific time on a later date would improve their chance of obtaining an interview from either a household respondent or a property manager. But the Bureau's 2016 Census Test and automated case management did not have an efficient way to leverage that information. Attempting contact at non-responding households at times respondents are expected to be available can increase the completion rate and reduce the need to return at a later date or rely on proxy interviews as a source of information.

The Bureau's automated case management system assigned cases to 6-hour time windows after estimating hour-by-hour probabilities of when best to contact people. The estimation relied on various administrative records, information from other Bureau surveys that had successful contacts in the past, as well as area characteristics. The 2016 Census Test did not have a way to change or update these estimates when cases were subsequently reassigned. The goals of assigned time windows were intended to result in more productive visits and reduce costs.

When enumerators identified potentially better times to attempt a contact, they were instructed to key in this information into their mobile devices. For example, one enumerator keyed in a mother's request to come back on Thursday afternoon when her kids were in camp, while others keyed-in information like office hours and telephone contact numbers obtained from signs on the property they had seen for property managers. However, according to the Bureau, this updated information went unused, and we met enumerators who had been assigned to enumerate addresses at the same unproductive time after they had written notes documenting other better times to visit.⁹ Another enumerator reported

⁹Interviewers were not assigned specific times for specific interviews but were, rather, provided the order in which they were to attempt contact for each case within their time window of work. So, where a given case appeared within the case list, combined with the distances over which enumerators were routed to complete their cases that day, constrained what time an enumerator could attempt the given case.

visiting a property manager who complained that the enumerator was not honoring the manager's earlier request made during a prior enumeration attempt that an enumerator return during a specified time window. Such repeat visits can waste enumerator time (and miles driven), and contribute to respondent burden or reduced data quality when respondents become annoyed and may become less cooperative.

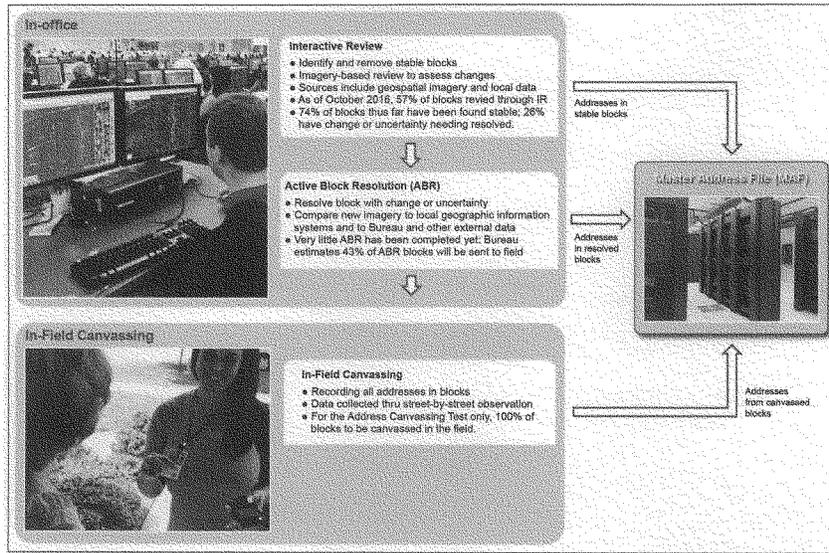
We discussed our preliminary observation with managers at the test sites, who expressed frustration that the automated case management system did not allow them to record the locally-obtained data on when to contact people whom they found in enumerator notes in a way to affect future case assignment. Headquarters staff told us that while they have not fully evaluated this yet, they are concerned that providing local managers with too much flexibility to override the results of optimized case and time assignments would undermine the efficiency gains achievable by the automation. They also explained that enumerators were to have been provided capability to record what day or what time of day for follow-up. This information could have been used by the automated case management to better target the timing of future assignments. However, they acknowledged that this procedure may not have been either fully implemented or explained during enumerator training. Bureau officials have said that this is another area they are planning to address.

The Bureau Has Fundamentally Re-engineered Address Canvassing for 2020

The Bureau has reengineered its approach to building its master address list for 2020. Specifically, by relying on multiple sources of imagery and administrative data, the Bureau anticipates constructing its address list with far less door-to-door field canvassing compared to previous censuses.

One major change the Bureau is making consists of using in-office address canvassing—a two-phase process that systematically reviews small geographic areas nationwide, known as census blocks, to identify those that will not need to be canvassed in the field, as shown in figure 2.

Figure 2: Reengineered Address Canvassing



Source: U.S. Census Bureau and GAO analyses of Census Bureau information. | GAO-17-238T

The Bureau estimates that the two phases of in-office canvassing will result in roughly 25 percent of housing units requiring in-field canvassing, instead of canvassing nearly all housing units in the field as done previously. With in-office address canvassing clerks compare current aerial imagery for a given block with imagery for that block dating to the time of the last decennial census in 2010. During this first phase, called Interactive Review, specially trained clerks identify whether a block appears to have experienced change in the number of housing units, flagging each block either as stable—free of population growth, decline, or uncertainty in what is happening in the imagery over time—or “active,”

in which case it moves to the next phase. Addresses in stable blocks are not marked for in-field canvassing.

For blocks where change is detected or suspected, the Bureau uses a second phase of in-office canvassing, known as Active Block Resolution, to attempt to resolve the status of each address and housing unit in question within that block. During this phase, clerks use aerial imagery, street imagery, and data from the U.S. Postal Service, as well as from state, local, and tribal partners when reviewing blocks. If a block can be fully resolved during this phase of in-office canvassing, the changes are recorded in the Bureau's master address file. If a block cannot be fully resolved during the second phase of in-office canvassing, then the entire block, or some portion of the block, is flagged for inclusion in the in-field canvassing operation. In-office address canvassing began in September 2015 with plans for a first pass of the entire country to be completed by the end of fiscal year 2018. In-field canvassing for the 2020 Census is scheduled to begin in August 2019.

Another major change the Bureau is making for its re-engineered address canvassing is significantly expanding the role that state, local, and tribal partners can play throughout the decade in contributing to an accurate, more up-to-date address list. Through the Geographic Support Systems Initiative, begun in fiscal year 2011, partner jurisdictions have been providing address and spatial data to the Bureau to help validate and supplement the Bureau's address list. As of October 2016, the Bureau reported that it had received partner data covering 73 percent of all known housing units nationwide. It added that the vast majority of the addresses in the files that the Bureau had processed as of July 2015 have either been matched with existing addresses in its database, or added to the address list. As with previous decennial censuses, as directed by Congress,¹⁰ the Bureau will also engage with state, local, and tribal partners through its Local Update of Census Addresses¹¹ program in fiscal years 2018 and 2019 in order to ensure that jurisdictions have the ability to comment on the address list prior to enumeration. The Bureau plans to rely on the in-office part of address canvassing to validate a large

¹⁰13 U.S.C. § 16.

¹¹The Local Update of Census Addresses is a program whereby state, local, and tribal governments may review and provide comment on the Bureau's address list for their communities prior to decennial enumeration.

part of the addresses added to the list during that program where data are available to permit it.

The Bureau is testing its re-engineered address canvassing operation in two sites through December 2016—in Buncombe County, North Carolina, and St. Louis, Missouri. In-office canvassing for the test sites began at the Bureau's National Processing Center in Jeffersonville, Indiana, in August 2016. The exercise will test the Bureau's assumptions about the cost and effectiveness of the re-engineered approach, as well as the quality of in-office canvassing, field staff training, and the use of new collection geography in the field. In addition to the 100 percent in-office canvassing the Bureau plans for 2020, the Bureau will also canvass 100 percent of the test areas in the field so that it can compare results it obtains for blocks where it would not otherwise have gone door to door. The Bureau hired 262 in-field listers across both sites to conduct the door-to-door canvassing, also beginning in October with a relisting operation commencing in November.

Although the innovations the Bureau is planning with its reengineered address canvassing have the potential to reduce costs, they entail some risks that could affect the cost or quality of the address canvassing operation. According to the Bureau, these risks include:

- **Locating Hidden Housing Units.** The Bureau recognizes that certain kinds of dwellings are hard to identify and may not have been marked as housing units at the time of address list development and not included in any databases. This could lead to their being missed and occupants not being counted in the census. These units are referred to as hidden housing units and include such living arrangements as attics, basements, or garages converted into housing units. According to the Bureau, while in-field canvassing also has similar risks for missing these types of housing units, solely relying on the use of imagery to identify these units could lead to an incomplete address list.
- **Monitoring Change in the Housing Stock.** When the Bureau determines during the first phase of in-office canvassing that a block has not experienced population change, the Bureau plans to subject the block to later monitoring so that if later change is detected, the block can be reassigned for further review. The Bureau has developed the conditions or "triggers" for subjecting blocks to later monitoring, but has not yet determined how it will operationalize them. According to the Bureau, if the triggers that the Bureau is developing

for this process do not adequately detect recent change, then housing unit growth may be missed, and the resulting address list may not be up-to-date.

- **Obtaining Quality Data.** For the Bureau to adequately review enough blocks in-office—and therefore reduce field costs of door-to-door canvassing—the Bureau needs to have data of sufficient quality to make reliable determinations about changes in housing units within those blocks. According to the Bureau, if it does not obtain sufficient satellite imagery (covering areas with both current and prior census imagery) or address and spatial data from state/local/tribal partners, then it may be forced to send more blocks than planned to in-field canvassing.

We have ongoing audit work examining the Bureau's re-engineered address canvassing approach. The justification of key cost and data quality assumptions, the approaches to mitigating key risks, and the Bureau's adherence to timelines and canvassing schedules are all subjects of our ongoing work, which we plan to report on early next year.

Lessons Learned from the 2010 Census Can Be Applied to Preparations for 2020

The Bureau goes to great lengths each decade to improve specific census-taking activities. But these incremental modifications have not kept pace with societal changes that make the population increasingly difficult to locate and cost-effectively count. This increasing difficulty and escalating costs led the Bureau to re-engineer its approach for the 2020 Census. While preparations for 2020 are still underway, and with testing still occurring, the Bureau's experience in planning for 2010 can enhance its readiness for 2020. For example, as the Bureau continues its planning efforts for 2020, our prior work indicates that it will be essential for it to address the following three lessons learned:

- Ensure key census-taking activities are fully tested
- Develop and manage on the basis of reliable cost estimates
- Sustain workforce planning

Ensure key census-taking activities are fully tested. The census is a large, complex operation comprised of thousands of moving parts, all of which must function in concert with one another to secure a cost-effective count. While the census is under way, the tolerance for any breakdowns is quite small. Given this difficult operating environment, rigorous testing is a critical risk mitigation strategy because it provides information on the feasibility and performance of individual census-taking activities, their potential for achieving desired results, and the extent to which they are able to function together under full operational conditions. Given the new

four innovation areas for the 2020 Census, it will be imperative that the Bureau have systems and operations in place for the 2018 End-to-End Test that will take place in three locations, covering more than 700,000 housing units in total. The 2018 test locations are: Pierce County, Washington; Providence County, Rhode Island; and the Bluefield-Beckley-Oak Hill area of West Virginia.

In our prior work on testing done for the 2010 Census, we noted that a sound study design should include such components as:

- clearly stated objectives with accompanying performance measures;
- research questions linked to test objectives and, as appropriate, a clear rationale for why sites were selected for field tests;
- a thoroughly documented data collection strategy;
- input from stakeholders and lessons learned considered in developing test objectives; and
- a data analysis plan including, as appropriate, methods for determining the extent to which specific activities contribute to controlling costs and enhancing quality.¹²

Develop and manage on the basis of reliable cost estimates. Reliable cost estimates that appropriately account for risks facing an agency can help an agency manage large complex activities like the 2020 Census, as well as help Congress make funding decisions and provide oversight. Cost estimates are also necessary to inform decisions to fund one program over another, to develop annual budget requests, to determine what resources are needed, and to develop baselines for measuring performance. The Bureau has a history of unreliable cost estimation and resultant overruns. For example, we placed the Decennial Census on our High Risk list in 2008 in part due to weaknesses in the Bureau's estimation of its 2010 Census life-cycle cost.¹³

Recently, we reported in our review of the Bureau's October 2015 life-cycle cost estimate that in order for the Bureau to improve its ability to

¹²GAO, *2010 Census: Basic Design Has Potential, but Remaining Challenges Need Prompt Resolution*, GAO-05-9 (Washington, D.C.: Jan. 12, 2005).

¹³GAO, *Information Technology: Significant Problems of Critical Automation Program Contribute to Risks Facing 2010 Census*, GAO-08-550T (Washington, D.C.: Mar. 5, 2008). Other factors contributing to the 2008 high-risk designation included long-standing weaknesses in the Bureau's management of information technology and the fact that the Bureau delayed the dress rehearsal and dropped several operations.

control the cost of the 2020 Census, it will be critical for it to have better control over its cost estimation process.¹⁴ While we found that the Bureau has taken significant steps toward improving its capacity to produce reliable cost estimates, those efforts had not yet resulted in a reliable decennial cost estimate.

Among the four broad characteristics of a reliable cost estimate—none of which the Bureau fully met—the Bureau reported it was focusing its attention on improving the documentation of the cost estimate, in order to help improve other characteristics as well.¹⁵ While poor documentation affected our ability to assess the reliability of the Bureau's cost estimate's other characteristics, we believe the problems we observed related to an absence of internal control procedures over the cost estimation process, which resulted in poor documentation.

Furthermore, we found the Bureau lacked guidance to control the cost estimation process. Investment in the planning documents to help control and support cost estimation early in the estimation cycle, such as with an operational plan, guidance on key steps and process flows, assignment of responsibilities, and job aids for staff can help institutionalize practices and ensure that otherwise disparate parties in the process operate consistently. As we reported, taking steps to ensure its cost estimate is reliable would help improve decision-making, budget formulation, progress measurement, course correction when warranted, and accountability for results.

We made three recommendations including that the Bureau take specific steps to ensure its cost estimate meets the characteristics of a high-quality estimate and improve control over how risk and uncertainty are accounted for in cost estimation, with which the Department of Commerce agreed. Bureau officials have stated that they plan to address the

¹⁴GAO, *2020 Census: Census Bureau Needs to Improve Its Life-Cycle Cost Estimating Process* GAO-16-628, (Washington, D.C.: June 30, 2016).

¹⁵Our Cost Estimating and Assessment Guide describes best practices for the development of reliable cost estimates. For our reporting needs, in the cost guide we collapsed these best practices into four general characteristics for sound cost estimating: comprehensive, well documented, accurate, and credible—and identified specific best practices for each characteristic. GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (Supersedes GAO-07-1134SP), GAO-09-3SP (Washington, D.C.: Mar. 2, 2009).

recommendations with their update of the 2020 Census Lifecycle Cost Estimate in December 2016. We plan to assess this cost estimate as soon as it is available.

Sustain attention to workforce planning. Strategic workforce planning encourages agency managers and stakeholders to systematically consider what is to be done, when and how it will be done, what skills will be needed, and how to gauge progress and results. Sustained workforce planning can help the Bureau stay on track for the 2020 Census and help avoid past staffing problems. For example, a Bureau assessment of its experience with the 2010 Census observed that areas such as the management of large programs and projects, cost estimation, and information technology (IT) lacked staff with core skills and experience. Moreover, the Bureau's experience with the 2010 Census and prior enumerations has shown that not following leading practices in workforce planning can increase the risks of subsequent downstream operations, such as cost estimation.

In 2012 we reported that while the Bureau's workforce planning efforts were generally consistent with such key leading practices as identifying current and future critical occupations, the Bureau had not coordinated workforce planning efforts across its directorates for key occupations.¹⁶ Without a Bureau-wide competency assessment, for instance, the Bureau risked not having the necessary workforce in place to manage the multimillion dollar IT investments for its 2020 operations. We found the Bureau also needed to address having inadequately trained cost estimating staff so that it could produce credible, comprehensive, and accurate cost estimates. Moreover, the Bureau needed to devote greater attention to setting goals and monitoring progress for skills gaps—as well as engaging stakeholders in developing, communicating, and implementing its workforce plan—so that the Bureau could identify and avoid possible workforce plan implementation barriers.

Since that time, the Bureau has taken actions in response to our recommendations to coordinate and set goals for its workforce planning. For example, in September 2014, the Bureau drafted action plans to

¹⁶GAO, *2020 Census: Additional Steps Are Needed to Build on Early Planning*, GAO-12-626 (Washington, D.C.: May 17, 2012) and *Information Technology: Census Bureau Needs to Implement Key Management Practices*, GAO-12-915 (Washington, D.C.: Sep. 18, 2012).

address the skills gaps that had been identified as part of a Bureau-wide competency assessment. The Bureau has indicated that a 2020 directorate-wide workforce assessment report is in its final review stages and will include a comprehensive succession planning strategy.

These actions taken by the Bureau to incorporate key leading workforce planning practices will help the Bureau meet its objective of having a workforce matched with the demands of the 2020 Census. Going forward, a sustained focus on workforce planning will be necessary to ensure the Bureau will be in a position to hire the optimal mix of managers and technical experts to carry out a cost-effective census.

In summary, the key innovations the Bureau plans for 2020 show promise for controlling costs and maintaining accuracy, although there are significant risks involved. The Bureau is aware of these risks, and robust testing can help manage them by assessing the feasibility of key activities, their capacity to deliver desired outcomes, and their ability to work in concert with one another under operational conditions. While the Bureau decided to stop key field testing planned for fiscal year 2017 in order to mitigate a funding risk, this decision may have consequences for elements of field operations not getting tested as a result, and, ultimately, for the 2020 Census.

Going forward, once the Bureau has the test results, past experience has also shown the importance of refining operations as needed based on the results of the tests, incorporating lessons learned from 2010 as appropriate, and making needed changes to its design in time to be included in the Bureau's End-to-End Test scheduled for 2018.

Chairman Meadows, Ranking Member Connolly, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions that you may have.

GAO Contacts and Staff Acknowledgments

If you have any questions on matters discussed in this statement, please contact Robert Goldenkoff at (202) 512-2757 or by e-mail at goldenkoffr@gao.gov. Other key contributors to this testimony include Lisa Pearson, Assistant Director; Mark Abraham, Peter Beck; Devin Braun; Jeff DeMarco; Robert Gebhart; Emily Hutz; Richard Hung; Donna Miller; Ty Mitchell; Kayla Robinson; Kathleen Padulchick; Robert Robinson, and Timothy Wexler.

Mr. MEADOWS. Thank you. Thank you all for your testimony.

So the chair recognize himself for a series of questions.

So, Mr. Smith, let me come directly to you, since it seems that a lot of this is following in your area. And Mr. Powner talked about your assurances with regards to a couple of areas where you don't have the direct authority but believe that you can deliver.

How do you do that when things go wrong? And I guess my concern is, is when everything is going right, there's enough people around to take credit. When they go wrong, you know, then all of a sudden there is a lot of finger pointing. And so should we address that now to make sure that you have the ultimate authority as the GAO would encourage you to have?

Mr. SMITH. Chairman Meadows, thank you for the question.

What I have in place to assure from a FATARA standpoint and also assure from an execution standpoint that the census will be successful is governance to make sure the acquisitions are done appropriately, as well as governance on all of the technology solutions being proposed from the infrastructure support to make sure they're done the right way and they are actually done with the least amount of risk from a technology standpoint.

By putting these in place, I am comfortable that I am able to give the business, decennial as well as from the mission standpoint, the Census Bureau director and others, the right level of risk that potential solutions may have and we make the right decisions to move forward.

I think—

Mr. MEADOWS. All right. Let me interrupt you. What is the right level of risk? Because that's a qualitative statement, and I want to make sure we are all on the same sheet of music.

Mr. SMITH. Absolutely. My first and foremost importance is to make sure that the systems are ultimately secure, the data is confidential, integral, and the systems are available. There are some potential reasons why you would want to do some of those solutions a little bit different for the 2020 based on the scale and the size of the data coming in. To me, these are not large-level risks as long as we have a large-level view of what it means from the security aspect and the ability to recover the systems.

Mr. MEADOWS. Well, then let's go ahead and talk about that a little bit. Because I guess one of my concerns is it seems like half of the systems—and maybe I misheard what you said—but half of the systems will not actually be implemented before we start end-to-end testing. Is that correct?

Mr. SMITH. That is not completely accurate. Some of the tentative dates that were not in the master—the IIP plan, those are to be delivered as well. They are all tentatively scheduled before August. Sixty percent of the systems are to be delivered before August.

Mr. MEADOWS. So only 40 percent of them will not be implemented for end-to-end testing. So I was wrong by 10 percent.

Mr. SMITH. Uh-huh. But some of the ones—

Mr. MEADOWS. All right. So let me get to the crux of the matter. The big one, fraud prevention, according to what you've given us, it doesn't look like you plan to deliver that until March of 2020. And so I'm looking at this, and it's very troubling, because we've

got a 2020 go-live estimate, and you've got fraud detection systems, the delivery is March 20 of 2020, and then we've got the other one of real-time non-ID processing, which says, basically, is this the real person that is coming in and actually filling it out, and you've got a delivery of March 20 of 2020 on that one as well.

How in the world are you going to test something and plan to go live a month or 2 after that with those two critical components? I mean, I see that as the crux of why we're here today. And your delivery schedule would suggest that we're going to do all the testing and then throw in fraud prevention a month or 2 before we actually go live?

Mr. SMITH. Chairman Meadows, I completely agree with the concern. I will have to go look back at the tests, the system lists we delivered, and the dates to see how they would say 2020.

Mr. THOMPSON. May I?

Mr. SMITH. You can.

Mr. THOMPSON. Congressman, if I could just say something. So we are continually working on understanding the cyber risks of our fraud protection. And so we will run something in the 2018 End-to-End Test. We will continue to improve upon that using knowledge that comes in about what are potential vehicles for fraud, and we want to keep that open quite a bit so we keep updating the system.

But let me assure you, we plan an extensive program where we will reinterview a sample of every response we get to the census, both non-ID and ID'ed, and use that information to determine the quality of the responses in the census.

Mr. MEADOWS. So when do we deliver those systems? Because, we can't deliver them, Director, you know we can't deliver them in March of 2020 and expect to have any kind of integrity and confidence in those, even if we may be doing some type of testing now.

Mr. SMITH. And, Chairman Meadows, my answer to the delivery date that was there, there is obviously a delivery date that is going to be done for 2018. I need to get back to the group with what that date is. Our intentions are to have some of the system in place to do some testing in 2018.

Mr. MEADOWS. All right. So do I have your commitment that the delivery of the fraud prevention and the non-ID will be done before we do end-to-end testing, you know, pure and simple?

Mr. SMITH. Yes, sir, you do.

Mr. MEADOWS. Okay. And so you will get back to this committee and with Mr. Powner in terms of that?

Is that something that you can live with, Mr. Powner?

Mr. POWNER. Yeah. I think your questions, Chairman, are right on. I mean, clearly, there are delivery dates, but there's also delivery dates, there's some integration to key systems that should occur prior to the end-to-end test.

I think the thing is, if you look at this realistically, everything be done, all 52 systems by August of 2017? Likely not. Likely not. And if it's not done—

Mr. MEADOWS. Yeah. Of course, he modified that. He said that 40 percent of them won't be done.

Mr. POWNER. If it's not done, let's look at it realistically, if it's not done, then there's ways to test it by other means. I mean, this

may be not ideal with the operations, but that's why it's so important that these systems, we need to really dog the delivery, the integration, and the results of the tests.

So if everything doesn't go smoothly with the end-to-end test, we still do have some time to test not ideally, but we could still test leading up to the actual decennial. But I think what we need is real transparency on delivery dates, costs, and all that stuff so we can all effectively work together.

Mr. Smith and I have had some really good conversations about this. I was around for the 2010 Decennial. I testified in front of this committee multiple times when the handhelds failed. There's a history of not having strong governance over these things. I do think the integration contract could help them, but also, too, the integration contractor, we're putting a lot of responsibility on them. It's close to a billion-contract, and we need to ensure that there's real delivery coming from that contractor, too. I imagine you're going to be talking to that contractor down the road.

Mr. MEADOWS. Sooner than later, yes. And I think as we look at that, I appreciate you acknowledging the back-and-forth, because I do believe that we've had that, these key things. We're going to find a lot of stuff that is troubling, but we have a very, very short window. I mean, it's even shorter than 6 months. Some of the decisions that have to be made, as we've talked about, they need to be made, you know, in the next 60 to 90 days, and so as we look at that.

So let me finish up with one, and then I'll recognize the ranking member.

Director Thompson, in your opening testimony you talked about a lot of the testing and a lot of the things that are going on. So help me really take all of that testimony and, I guess, fine-tune it. With the test results that you've seen to date and where we are, how do you feel like that will compare to the actual results of the census when it comes in? I mean, what are the anomalies, I guess, is what I'm saying?

Mr. THOMPSON. Thank you, Chairman Meadows.

As GAO testified, we found in our work in the 2016 test that we needed to work on our training procedures for our enumerators more. We need to do more work on preparing to enumerate in multi-unit structures. And we need to do more work on what we refer to as closeout procedures and what Mr. Goldenkoff was discussing as more of an unresolved. But we need to work on that, we learned that, and we have processes in place to get that set for the 2018 End-to-End Test.

And, again, we will have the same results coming out of that test. We'll share the results with the GAO, we'll share the results with you, so we all know where we are at that time.

Mr. MEADOWS. So if a number of 10 says we're all the way there, where are we today based on the test results that you've seen?

Mr. THOMPSON. I'm just smiling, because the last time I did probabilities, I got in a lot of trouble. But I would give it an eight.

Mr. MEADOWS. Okay. Thank you, Director.

And the chair recognizes the gentlewoman from New York, Mrs. Maloney.

Mrs. MALONEY. Thank you. And thank all the panelists.

And I share the chairman's concern about security for the 2020 Census, cybersecurity. As we know, in 2015 the cyber breach of the Office of Personnel Management resulted in the theft of personal identifiable information of more than 21 million Americans. And the 2020 Census will create a repository vastly larger than what the hackers stole from OPM.

So the security of the census information is of truly utmost concern by individuals, and they want to be assured that it's there before they even participate. And there is no question that encryption is a key component of information security.

But, Mr. Smith, I understand that some 2020 Decennial computers for the census are too old to use encryption. Is that correct?

Mr. SMITH. Congresswoman, I appreciate the question.

I have to go look back to see which ones are too old to use encryption. There's encryption in transit and there's encryption at rest from data.

I will assure you from the standpoint from the security aspect that the approach we are taking to layer and isolate the security parameters in the network actually make these legacy systems, if they are too old for encryption, they are well behind and inside of the census data centers, that the ability to interact with these systems is limited from the outside world.

From the data-collection aspect, when people are responding to the Internet site, we're taking very specific and intentional steps to make sure that that data is well protected and safeguarded and secure, which these systems you mentioned, that wouldn't apply to if they're "too old," quote, to go through encryption. I'd have to look at that, though.

Mrs. MALONEY. Well, I think it would be important to get back to the chairman a listing of how many of these computers and their systems are too old for encryption.

Mr. Smith, what concerns does that raise, and how will they be addressed?

Director Powner's GAO "Better Management of Interdependencies Between Programs Supporting the 2020 Census is Needed" report highlighted the fact that the 2020 Census will be the first one in which respondents are heavily encouraged to respond by the Internet. And GAO has previously reported that malicious email attacks are among the growing cyber threats facing the Federal Government.

So, Mr. Smith and Director Powner, your comments?

Mr. SMITH. So from the malicious emails aspect, what we are doing is we are going to engage industry-leading solutions to detect rogue emails, detect Web sites that are impersonating the census, and put some specific things within our system so the public can identify what is a census system they should be applying to in interacting with the Internet self-response.

We're also going to be taking steps with the communications contract we have signed with the decennial to go through and educate the public on what they should be doing for phishing, what they should be doing against these attacks to get in front of it as much as possible both before the 2020 Census occurs and regularly through the 2020 Census.

Mrs. MALONEY. And Director Powner, adding to my question, does the 2020 Census' reliance on the Internet create an additional risk of respondents falling victim to attacks?

Mr. POWNER. Yeah. Clearly, we're concerned about phishing attacks. Also, too, if you look at it holistically, you have to also secure the mobile devices. We have cloud services we're likely going to be procuring, we need to ensure there is the appropriate level of security with the cloud. And then configuring all the 2020 systems, these 50 systems that we talked about, we're looking at that for you right now. We're going to continue to report back to the committee on that. But clearly, it's a concern.

I do think folks at the Census Bureau, it's a high priority for them. When we talked to the contractors, there, too, it's also one of the high-risk areas. So there's a heavy focus on that right now. But we'll continue to track that for you.

Mrs. MALONEY. Okay. And, Mr. Smith, is the Bureau using the services of outside organizations to help implement and test cybersecurity?

Mr. SMITH. Yes, we are. We're using outside resources, Department of Homeland Security. We're also using industry-leading companies to help evaluate our security architecture, as well as test the vulnerabilities and test the penetration, which basically means attempt to break through the architecture we've designed for the 2020 Census systems.

Mrs. MALONEY. Well, Director Powner, based on what you've heard today, how confident are you that the Census Bureau and the Department of Commerce are implementing sufficient levels of cybersecurity for the 2020 Census? And, you know, your report showed that there are many intelligence challenges because of the new technologies.

Mr. POWNER. Yeah. Clearly, what we will be looking at, I think the penetration tests that Mr. Smith mentioned, we want to look at how complete they are, what the results are.

And I mentioned in my oral statement, too, I think a key oversight area for this committee is the authority to operate signature on all these systems. You know, clearly if you look back on healthcare.gov, I testified on that, that was a key issue. There was an authority to operate, but there were vulnerabilities associated with the authority to operate that some would argue weren't acceptable. And I think that will be a key oversight item for this committee.

Mrs. MALONEY. And, Mr. Smith, what assurances can you give that the Bureau's IT progress is appropriate? I mean, there are new, tremendous challenges in IT. Last month, the Bureau provided the committee with information relating to its remaining IT decisions, and we were told that there are 48 IT-related decisions left. Is that correct? So how would you characterize the Bureau's progress, or lack thereof, of meeting its deadlines?

Mr. SMITH. Thank you for the question.

There are approximately 40 IT decisions left from the list. These are decisions that we're going to make as we learn from the operational tests, things that need to be implemented.

I can assure the subcommittee from the standpoint of how we're securing the technology enables us to actually develop the tech-

nology iteratively and agilely, which is recommended by the Federal Government as far as approaching large-scale systems of this nature. And I can assure the subcommittee that by developing things agilely, we are going to know how things work and how secure they are along the way as we are developing it. We are not going to wait till the end to do the testing and do the security of these systems.

Mrs. MALONEY. Any other comments?

My time has expired. Thank you.

Mr. MEADOWS. I thank the gentlewoman.

The chair recognizes the gentleman from Wisconsin, Mr. Grothman, for 5 minutes.

Mr. GROTHMAN. Thank you.

A couple of questions where, I guess, the Census Bureau gets in the news. There's been a lot of discussion in recent times in the newspapers about undocumented or illegal immigrants, and I think the number is to a certain extent based on Census Bureau data. Do you guys generate the numbers of people who are not citizens in this country?

Mr. Thompson? Director Thompson?

Mr. THOMPSON. Thank you. We don't produce a number of the undocumented people in the country. I mean, we do produce data that researchers in the field use to make estimates of that, but that's not a Census Bureau product.

Mr. GROTHMAN. Okay. So when you give us the total people in the country, you have no idea whether they are citizens or not? That is not something you concern yourself with?

Mr. THOMPSON. Thank you, Congressman.

When we produce our estimates from the decennial census, it includes everyone in the country, and we don't distinguish between those that are documented and not documented, and we don't ask.

Mr. GROTHMAN. Okay. So we have no idea whether they are a student here on a visa or a short-term visa or a person who is here illegally, you have no idea?

You said you make an estimate, though. How do you make that estimate?

Mr. THOMPSON. I'd have to get back to you on that.

Mr. GROTHMAN. You have no idea?

Mr. THOMPSON. I'm not a demographer. But we do have a lot of good demographers at the Census Bureau.

Mr. GROTHMAN. Any other guys know?

And as I understand it, in banding about this 11 million figure for 15 years or something, I'm told it's based on census data. Do you any of you guys know how they generate that number? It's used by a lot of politicians. I just wondered. Why don't you guys get back to us on that.

Mr. GROTHMAN. Okay. The next question is, you have a tendency to generate statistics by what we'd call race. Is that right?

Mr. THOMPSON. We do. We do provide statistics by race.

Mr. GROTHMAN. And how is that determined, the race of those? They all self-identified, or how would you define? Given that in today's world we have more and more I guess what you'd call biracial people, how do you generate those numbers? First of all, give me the breakdown on the different races that you try to identify.

Mr. THOMPSON. So we follow the guidance of the Office of Management and Budget and establish the racial classifications that are used in the United States. And this includes major categories, such as African American, such as White, such as Asian, such as Native Hawaiians and Pacific Islanders and American Indians and Alaska Natives.

Within that, because we have a decennial census, we collect more detailed information. We also collect the category on the decennial census other race.

Again, all this follows the guidance that the Office of Management and Budget establishes for assigning racial classifications in the United States.

Mr. GROTHMAN. We're dealing with kind of inflammatory stuff. I would think over time more and more Americans are not 100 percent something.

Mr. THOMPSON. Congressman, let me also say that, starting in 1997, the OMB directed that respondents be given the option of responding to more than one race. So respondents can identify with any particular race or combination of races that they feel describes them.

Mr. GROTHMAN. Okay. Our President, how should he fill out that form?

Mr. THOMPSON. That's up to our President. I mean, seriously, it's self-response. So we don't—we present the categories, we present the information to our respondents, and then they identify with what they believe describes them.

Mr. GROTHMAN. Okay. So the figures are largely no guidance. Okay. I could be one-eighth American Indian, if I put down American Indian, that's what I am, right, according to guys?

Mr. THOMPSON. That would be your census response.

Mr. GROTHMAN. Okay.

Now I'll give a question to Mr. Goldenkoff.

The GAO found last time 25 percent of your cases resulted in non-interviews after six visits. So somebody went there six times, six attempts, nobody gave you the information. Is that right? Are those figures right?

Mr. GOLDENKOFF. Yeah. And just to clarify, I believe it was 30 percent at the Texas test site and 20 percent at the Los Angeles test site.

Mr. GROTHMAN. Okay. Does this concern you?

Mr. GOLDENKOFF. It does concern the GAO, and for several reasons. One, it concerns us because the Bureau doesn't know the factors that contributed to the high levels of non-interviews. And then also, of course, that information would need to be imputed statistically on those missing housing units.

So there are a couple of factors that could have influenced those high non-interview rates. It could have been, for example, the enumerators not following certain procedures they were supposed to if they couldn't get an interview. They were supposed to go to a neighbor or somebody nearby. But then this is where Director Thompson was talking about where the training needed to be improved. Perhaps that the enumerators didn't recognize the importance of going to a proxy. There are some other factors that could have influenced that as well.

But it is concerning to us, and that hopefully that the Bureau will be able to, you know, have data from this 2016 test to get a better understanding of what was behind those high non-interview rates.

Mr. GROTHMAN. Okay. I can see I've exceeded my 5 minutes, so we'll have to, when we go to conference later this week, we'll have to tell all our colleagues they missed an exciting hearing.

Mr. MEADOWS. I thank the gentleman from Wisconsin. It's duly noted. I appreciate the gentleman's questions.

We'll recognize the gentlewoman from the District of Columbia, Ms. Eleanor Holmes Norton, for 5 minutes.

Ms. NORTON. Thank you very much, Mr. Chairman. This is always an important hearing. It's important. It's timely. I would say it's timely. I hope it's in time.

And the enigma, of course, of the census is not whether you have one drop of black blood, but of how to count people and to give them the opportunity. I indicate that because there was a time in our country when that was, if not of the census, a way in which some States decided who is African American in our country. So the only thing a diverse democracy can do is to ask you, "Who in the hell are you?" and to have you fill it out.

I note that some people are using these apps and are finding that they are of many different ethnicities. But at the same time, they probably answer and many of them are answering "other."

I also want to say for the record that census is in the Constitution. At the time of the census, most people weren't even citizens, because they had arrived here and we were getting people coming in such large numbers. So it was important from the beginning just to know how many people were here. And from that, of course, scientifically, we can now—we now have a way to find who is documented and who is not.

Ms. NORTON. But I want to ask questions about this what I am calling the enigma of the minorities, which always vex the census. I want to turn to this Harris County field test. So that even using new technology, approximately 30 percent of the households—I think this is for you, Mr. Goldenkoff—approximately 30 percent of the households in the test could not be contacted after six good faith attempts.

My first question is, compared to how many attempts did it take for the 70 percent that could be contacted?

Mr. GOLDENKOFF. Well, that varied. It was between one and six.

Ms. NORTON. Yeah, well, obviously, it was between one and six.

Mr. GOLDENKOFF. Right. And, specifically, I don't know.

Ms. NORTON. I would like you to report back to this committee how many attempts does it take on the average to get a response. Because I think six is a good number. So I would like to have some explanation of these results.

Mr. Goldenkoff, how is this problem to be fixed? I mean, those people are out there. Surely they can't go uncounted.

Mr. GOLDENKOFF. Well, the first way of fixing it is getting a better understanding of what was causing it. And we were out there, I personally was out in Los Angeles, we had other GAOers out in L.A. And also in Texas. And, you know, based on our observations,

as well as our conversations with Census officials, there are a couple of things that could be behind it.

First, just the nature of the test itself may have high non-interview rates, and that is because it is not an actual census, and so the public may not be as aware that the census was being conducted as they would during an actual census just because during the actual census enumerators are under more time pressure; the Census Bureau also conducts a lot more outreach and promotion. So it could have been an awareness issue, people just don't want to answer their doors.

Another reason could be the devices themselves, that, you know, the way those hand-held devices worked, that after an attempt was made, they couldn't reopen a case. And so if someone came home and the enumerator was still in the area—and we did see this happen on a number of cases—they couldn't reopen that case to enumerate that person.

Ms. NORTON. They couldn't reopen the case?

Mr. GOLDENKOFF. Because it's just the way the hand-held devices worked, that there were certain—there are some reasons for that, you know, and I think this is just a more generic issue of being able to better balance the efficiencies that you get with the centralized control of an automated case management system with the flexibility that you get with enumerators on the ground being able to adapt procedures as they see fit. And it's a balancing act.

And so maybe, and this is something that we have been discussing with the Census Bureau, is how to, through the business rules and how the devices are managed, to allow for a little bit more flexibility in the procedures.

Ms. NORTON. Could I just ask, some of these seem important hypotheses. Are they being acted on? They seem to be a warning sign.

Mr. THOMPSON. Congresswoman, those rates are unacceptable for the 2020 Census. We have the information that will be available to make sure that we can go back to those households as many times as it takes to get a response. And we will do that, because we are not going to leave that much of the population—

Ms. NORTON. I understand that. That is important to here. And documenting what of the hypotheses you just heard was the cause would be important for the future as well.

Director Goldenkoff, is there any way to know—there should be a way to know—what percentage of those who did not use the Internet response option in the two tests were minorities?

Mr. GOLDENKOFF. Who did not use the Internet? So basically, if I understand your question correctly, you are asking minorities who responded other than the Internet through means—

Ms. NORTON. Who did not use the Internet response, who did not use the Internet response option in the two tests. I am talking about this test in this Harris County field test.

Mr. GOLDENKOFF. Right.

Ms. NORTON. How many were minorities?

Mr. GOLDENKOFF. That would be something that the Bureau could determine, I imagine.

Mr. THOMPSON. Congresswoman, we have that information. But let me say that for 2020 we aren't offering the Internet as the only

response option. So in 2020, for the first time, people can call up and give their interview over the phone.

Also, we do know that there are a number of people, a number of communities where they don't want to respond by the Internet. So we will be actually mailing out a questionnaire directly to about 20 percent of the households in the United States based on information we have about what kind of method they would prefer to respond.

Ms. NORTON. Well, the new technology may have gotten in the way here of getting an accurate count of people, particularly undocumented people or people who are leery of responding to people who open the door, I mean. Yet you did the field test using new technology. Was it to see whether new technology would be more efficient, would work?

Mr. THOMPSON. So our philosophy—

Ms. NORTON. You didn't use enumerators in this field test.

Mr. THOMPSON. We used enumerators, certainly.

Ms. NORTON. You did?

Mr. THOMPSON. Of course.

Ms. NORTON. In this field test, the Harris County field test?

Mr. THOMPSON. We certainly did. We certainly did. Now, like I said, if someone wants to respond by paper, eventually they will get a paper questionnaire, or they might get one right at the start.

Ms. NORTON. Do you imagine that among those that it took six attempts and still you couldn't respond, that they probably need to have some face-to-face or paper enumeration?

Mr. THOMPSON. The ones that took six were six face-to-face attempts. We went to the door and knocked on the door and nobody was—see that nobody was home or the door wouldn't be opened. These were six attempts after they received four—

Ms. NORTON. That is troubling.

Mr. THOMPSON. —contacts by the mail to respond.

Ms. NORTON. Very troubling. I don't know if it's when people go. Do people go only in the daytime? People may be, I hope, away at work.

Mr. Goldenkoff.

Mr. GOLDENKOFF. Yeah. I think that is one of the points that we made in my statement, is that being able to leverage the knowledge that the enumerators see on the ground. And, for example, one of the things that we saw time and time again was that enumerators would start their assignments about the middle of the afternoon, for example, but a lot of people aren't home. But then at the end of the day they would be finishing up around 5 o'clock when people were returning home, they could not reopen those cases. We saw this in multi-unit dwellings.

Ms. NORTON. This is a huge error.

Mr. GOLDENKOFF. Well, you know, this is something that, you know, this is what you learn by testing.

Ms. NORTON. Well, my God, we have been doing this—we have had, you know, we either have had two-parent families where both go out to work or single-parent families where we hope somebody is working for a very long time, and the notion that we don't know that people aren't home in the middle of the day.

Mr. THOMPSON. Congresswoman, if I might.

Ms. NORTON. Yes, sir.

Mr. THOMPSON. In previous censuses, what we would do is we would give an enumerator a stack of questionnaires and we would tell them to go out and get those questionnaires enumerated. We had no idea of what time they were going out or when they were going or where they were going.

Now we do have the ability to know when they are going to a house, and we have the ability to tell them they can't go during the day and they have to go in the evening. So we do have that ability now that we didn't have before.

Ms. NORTON. This is very important. You know, I would hazard a guess—I do have one important question, if I can go before this—I would hazard a guess that most Americans are not home in the middle of the day if they are fortunate enough to have a job or if they have children and they are in school. I don't know why enumerators wouldn't begin later in the day if we want an accurate census.

Mr. GOLDENKOFF. Well, in many cases they did. It all comes down to local knowledge, because we also saw examples where people worked the night shift, and the best time to get them was the middle of the day.

But one of the things, and this is where the need for that flexibility comes in, is that even though they could not leverage in a very centralized way, you know, an enumerator could write in "come back at 6 p.m. tomorrow," it was not managed centrally in a very good way. And that is what needs to be improved. I think there were procedures to do that, but it just didn't happen as often as it should have.

Ms. NORTON. And I see the need for a central management of the system along with the flexibility you were speaking of.

I do have to ask about what I believe is really a constitutional question, and that is prison gerrymandering, a huge distortion of the count because, for example, big cities will rarely have a prison in the middle of the city, and so it will be in another area, less populated.

This has gone to court. Recent cases have held that prison gerrymandering violates the Constitution. I hope we are finally going to settle this. But the Bureau recently put out a request for comment on its residence criteria, and here I am going to quote what you said: "The usual residence for counting purposes would be the prison in which the inmate is held."

Now, some States have moved forward to correct this huge distortion that can affect everything from where we count for Members of Congress, not to mention where resources go. So you are overcompensating where the resources may in fact not be going to schools, for example, in those schools and prisons.

I don't see how we can have it both ways, and want to know are we going to settle this question or are you looking forward to the census facing really a huge constitutional question because there are a number of cases and they will be on their way up. What are you doing to settle this question before the census?

Mr. MEADOWS. The gentlewoman's time has expired. You can answer very quickly if you have a response to that.

Mr. THOMPSON. I do have a response.

So we issued—and this was in the interests of being open, this is the first time we have done this—we issued our proposed criteria for determining residence in a Federal Register notice at the end of June. We gave a 30-day comment period. We extended the 30-day comment period based on requests from the committee. We have gotten over 78,000 comments, responses to that Federal Register notice, and we are now in the process of evaluating the very thoughtful comments that we got so that we can issue a final determination.

Ms. NORTON. Well, let's hope you take into account the recent litigation. You cannot have censuses where some States have corrected this, other States haven't, and then go to the American people and say we have an accurate census. You can't have two ways of counting the same population based on what State they are in.

Thank you very much, Mr. Chairman.

Mr. MEADOWS. I thank the gentlewoman for her interest in making sure that everybody is properly counted.

So let me kind of close out by asking a few questions to make sure that we are all marching to the same drumbeat, because I think we are getting closer. And so, Mr. Smith, let me start with you.

In October, we talked about doing, I guess it was a single operating system for deploying on mobile devices as part of that working group. And I think I read that indeed that is where you are going with that. Was that an accurate report or is it—was that correct?

Mr. SMITH. Chairman Meadows, I recall that we are going through to determine the mobile devices that are going to come in through a contract, and based on the operating systems the mobile device may choose to provide as a bid. The platform we are using to develop for the enumerators to produce the application can work on either mobile platform. There are very, very, very small changes beneath working on an Android or working on an iOS or working on other mobile device platforms. So the system itself can be—

Mr. MEADOWS. So for a non-techie, is that a “yes” to my question or a “no” to my question? I mean, is it a single operating system or not?

Mr. SMITH. No.

Mr. MEADOWS. So the reports were wrong.

Mr. SMITH. From the mobile device aspect—

Mr. MEADOWS. I think the reports basically said that you were going to that. And so—

Mr. THOMPSON. Congressman, we have just released our request for procurement for our device as a service contract. It came out yesterday. And we are going to carefully examine the solutions that the vendors propose. And it may very well be that some vendors will propose only one operating system.

Mr. MEADOWS. I understand what they are going to. What are you going to require? I mean, they will propose a lot of other things.

I guess here was my concern, is as we get to these different devices, and I talked to you about having one operating system on one and another on another, you are going to create the potential conflict there. So I thought we had made progress, and I was about

to say hurray for Mr. Smith, thank you for listening. And what I am hearing is that that may not be accurate.

Mr. SMITH. Yes, sir. The system itself is portable. It is like running Microsoft Word on an Apple computer or running it on a Microsoft computer. That version of the word processing software works on both.

I am comfortable with picking this industry leader to help produce the application, that their application works on Android, works on iOS, and will be able to work with whatever comes back from the device as a service.

Mr. MEADOWS. I guess it was an article by Phil Goldstein in FedTech. Were you all familiar with that? Maybe we follow this stuff closer than you do. It said Census Bureau plans to go mobile and rationalize their device portfolios. And it just talked about a device footprint. So perhaps we can clear it up.

I still have great concern if we have different operating systems. So the October meeting, that concern still stays there. So if you will just let me know as the procurement, Director Thompson, gets a little bit, what you are going to anticipate from our vendors.

Mr. Powner, let me come to you, because some of these timeframes, and according to Mr. Smith we are talking about 40 percent of those systems not being in place for end-to-end testing, is it possible for you to identify what systems could be descoped and would be appropriate to be descoped if the mission is too great?

Mr. POWNER. I think the key question on the descoping, and this is something we have talked to Mr. Smith about, is understanding what the critical path is. Not all those 50 systems are on the critical path. So there is a critical path.

I mean, sure enough, the Internet response and the mobile devices and the centralized, there are some things that are very big and important, right? We know those are on the critical path. But identifying everything on the critical path and then looking at potential descoping, you don't want to descope items on the critical path.

Right now, with the integration contractor and the integration test, I think that's a TBD, everything that really is on the critical path. So that's a key question about what is on that critical path from an integration point of view.

Mr. MEADOWS. So would you agree with that, Mr. Smith?

Mr. SMITH. Yes, sir.

Mr. MEADOWS. All right. So if you agree with that, then can you report back to this committee by the end of this year, and so I would say by December 31, with what I would call is a critical path analysis?

Mr. MEADOWS. A is critical path, we have got it, these are must haves. B would be, yeah, it's critical, these are nice to haves. And C, it's not part of the critical path at all, so those would be subject to descoping, as Mr. Powner talked about.

Mr. SMITH. And, sir, I would like to also address in the conversation we will have with GAO, it comes down to the context of the systems, too. As Mr. Powner discussed, data collection is utmost of importance, that the systems are prioritized and being done. Some of the things that are done after August are things that can by timeframe be done after August, and some of them are enhance-

ments to existing systems, like paper collection. So the context of the systems will also play—

Mr. MEADOWS. Well, and what I will ask on that A, B, and C, if you will put in parentheses a T next to it, if it is a timetable initiative that makes it perhaps less critical in terms of our end-to-end testing or where it is. Because I need to know what your thinking is on this, is, well, this is not critical because we can deal with it in November of 2019 versus this is just not critical. Does that make sense?

Mr. SMITH. Yes, it does.

Mr. MEADOWS. Okay. All right.

So Director Thompson, let me come back to you in terms of budgets on two different questions. So Ms. Holmes Norton was talking about going from Internet to paper and phone. If there is a disproportionate share of those that respond by phone or paper, you know, some other collection mode, how does that affect the budget and will that affect those numbers adversely in a significant way?

Mr. THOMPSON. Right now we have estimates of getting about 63.5 percent response in directly. It would cost more if more people preferred paper and more people preferred telephone. But it would certainly cost more if people did not self-respond at all and we had to go out and do the nonresponse follow-up.

So we do plan for contingencies in 2020 to allow us to be able to both fund and process if we get more paper or if we get more telephone calls. So that is in our contingencies for the 2020 Census.

Mr. MEADOWS. So can you provide to this committee then, and I won't fine tune it too much, but for each 2 percent miss in that 63 percent response rate, financially what does that mean? All right? So we won't do 1 percent or half percent, but we will assume that you've—

Mr. THOMPSON. So typically what we have done, and we will do this again, is we have said for every percent of increased non-response follow-up this is the marginal cost increase.

Mr. MEADOWS. All right. So you will do it for every—I was going to give you a break there. Mr. Goldenkoff is sitting there shaking his head “yes.” So you will submit that to the committee so that we have an expectation from a budgetary standpoint.

Mr. THOMPSON. Yes.

Mr. MEADOWS. All right. So let me talk about priorities. And I mentioned it in my opening statement with the reduction in the 2020 budget and what that has done in priorities.

Would you not agree that the most important aspect of your job is the 2020 Census, is the highest priority out of everything that you do?

Mr. THOMPSON. I would agree, Congressman, it's a constitutional mandate. But having said that, when we made our decisions for the 2017 budget we looked at both making sure that we could deliver a census in 2020 that would be cost-effective and innovative and on track, and at the same time maintain the important data we produce on the economy and give the Federal agencies the help—

Mr. MEADOWS. I was trying to give you a softball, Director Thompson, and your response is a swing and a miss.

Mr. THOMPSON. I was anticipating where you were going.

Mr. MEADOWS. Yeah, I am sure that you were. So let me be very clear. If we are going to cut the budget, it doesn't need to be cut from the census, it needs to be cut from other areas of responsibility, from my perspective. And then you know you have got an open door, that I am willing to go to the appropriators and I am willing to advocate on your behalf.

But if we are fully funding the other operations and we are not fully funding the 2020, I am not going to get calls on whether the other aspects of your job are done or not when they don't get fulfilled as much as I would the 2020 Census. Do you understand the importance of it from my standpoint and Ranking Member Connolly's standpoint?

The egg on our face will not happen with some of the other, granted, very important aspects that you have under your jurisdiction. But whether they get done or not, I get a call from someone in the bureaucracy here saying why haven't we done it, moreso than I will if we don't have the 2020 Census done properly and effectively. Would you not agree with that?

Mr. THOMPSON. I have got to say my number one goal is to do the 2020 Census in new and innovative ways, and effectively and accurately.

Mr. MEADOWS. I agree with that. I guess here is what I am asking you to do, is if you were making budget concerns that impact the implementation of this critical process that we have all been talking about, where it is, you know, 75 percent—or a 25 percent cut actually came out of the 2020 Census and very little cut came from some of the other responsibilities, and so I guess I question that decision in light of the priority that I deem the 2020 Census to be. And so let's have some further discussion, I will let you off a little easier on that.

Mr. THOMPSON. Congressman, I appreciate your willingness to talk about a number of things on the census and your willingness to engage with us. It has been very refreshing to work with you. So thank you.

Mr. MEADOWS. Well, if you will let me know—and I have told your staff this—from a budgetary standpoint, I am willing to camp out in the appropriators' lobbies until they want me to go home. How about that? And we will make sure that you get the resources, as long as you can get me those other numbers.

So I want to just say thank you. Let me just tell you, to have two different missions for your agencies in terms of your primary focus, but having one mission in terms of making sure that this is successful, I am pleased with the back and forth and the tension that sometimes is there and acknowledged, but yet at the same time what I am hearing is real progress. And so, Director Thompson, I want to just acknowledge that in terms of your leadership and your willingness to do that.

And so as we work going forward, I look forward to having each of you update us on a regular basis to make sure that we are making good progress.

And with that being said, if there is no further business before the subcommittee, it stands adjourned.

[Whereupon, at 11:35 a.m., the subcommittee was adjourned.]

