United States Government Accountability Office

Report to Congressional Requesters

August 2016

INFORMATION TECHNOLOGY REFORM

Agencies Need to Increase Their Use of Incremental Development Practices

GAO-16-469

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GAO Highlights

Highlights of GAO-16-469, a report to congressional requesters

Why GAO Did This Study

Federal agencies plan to spend more than $89 billion on IT in fiscal year 2017. Historically, long-term system development projects have often produced disappointing results. To help address these issues, OMB now requires agencies to deliver useable functionality every 6 months to reduce risk and deliver capabilities more quickly. GAO's objectives were to (1) describe the number of major IT investments primarily in development identified on the IT Dashboard as reporting the delivery of functionality every 6 months; (2) assess selected departments' and investments' delivery of incremental functionality and determine the factors affecting delivery rates; and (3) assess the quality and completeness of selected departments' plans to employ incremental development practices. GAO analyzed information on the IT Dashboard, analyzed reported project data and policies of 7 selected departments with the most investments primarily in development, and interviewed OMB and department officials.

What GAO Recommends

GAO is making 12 recommendations to 8 agencies to improve reporting of incremental data on the IT Dashboard and policies for CIO certification of adequate incremental development. Five departments agreed with our recommendations, the Department of Defense partially agreed with one and disagreed with another, OMB did not agree or disagree, and the Department of the Treasury did not comment on the recommendations. GAO continues to believe its recommendations are appropriate.

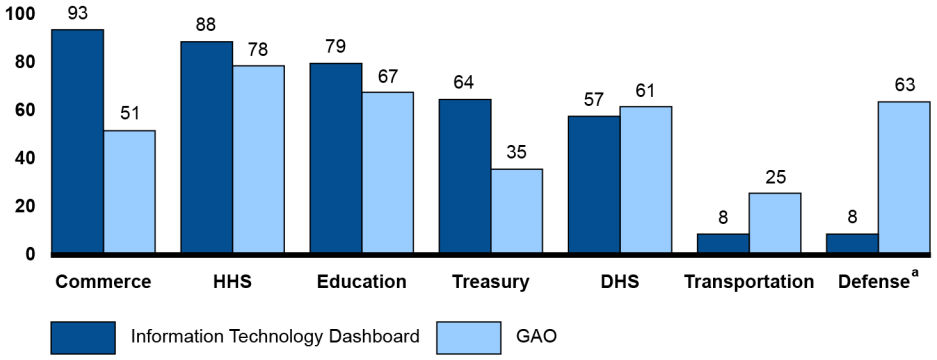
View GAO-16-469. For more information, contact David A. Powner at (202) 512-9286 or pownerd@gao.gov.

What GAO Found

For fiscal year 2016, 22 agencies reported 64 percent of their software development projects would deliver useable functionality every 6 months on the Information Technology (IT) Dashboard, as required by the Office of Management and Budget (OMB). However, shortcomings with OMB's guidance—the lack of clarity regarding the types of projects where incremental development would not apply and how the status of these non-software projects should be reported—have affected the accuracy of the data on the IT Dashboard.

GAO reviewed 7 departments' software projects and found approximately half of these projects reported delivery of functionality every 6 months. However, there are significant differences in the data reported to GAO and on the IT Dashboard (see figure below) due to inconsistencies in reporting non-software projects, the timing of reporting, and a lack of support for reported delivery, which affects the accuracy of reported rates. Department officials also reported that management and organizational challenges and project complexity and uniqueness impact their ability to deliver incrementally. It is critical that departments continue to improve their use of incremental development to deliver functionality and reduce the risk that these projects will not meet cost, schedule, and performance goals.

Comparison of Software Development Projects' Percentage of Planned Delivery Every Six Months Reported on IT Dashboard and to GAO for Fiscal Year 2016



Commerce (Department of Commerce), HHS (Department of Health and Human Services), Education (Department of Education), Treasury (Department of the Treasury), DHS (Department of Homeland Security), Transportation (Department of Transportation), Defense (Department of Defense)

Source: GAO analysis of department data. | GAO-16-469

[a]Defense did not provide the requested information in time to verify the information reported to GAO.

Although OMB's requirement has been in place since June 2015, only three departments (Department of Commerce, Department of Homeland Security, and the Department of Transportation) had policies and processes to ensure that the chief information officer would certify IT investments are adequately implementing incremental development. Officials from three departments reported they were updating their existing policies to address certification, but had not yet finalized these efforts, and one department stated its current processes were sufficient.

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Abbreviations

CIO	chief information officer
Commerce	Department of Commerce
Defense	Department of Defense
DHS	Department of Homeland Security
Education	Department of Education
FITARA	*Federal Information Technology Acquisition Reform Act*
HHS	Department of Health and Human Services
IT	information technology
OMB	Office of Management and Budget
Transportation	Department of Transportation
Treasury	Department of the Treasury

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August 16, 2016

The Honorable Ron Johnson
Chairman
Committee on Homeland Security
and Governmental Affairs
United States Senate

The Honorable Jason Chaffetz
Chairman
Committee on Oversight and Government Reform
House of Representatives

Federal agencies rely on information technology (IT) systems to provide essential services affecting the health, economy, and defense of the nation. In fiscal year 2017, agencies plan to spend more than $89 billion on IT, and in fiscal year 2016, plan to spend at least $82 billion, including more than $43 billion on 752 major IT investments.[1] With 169 of these major IT investments in a development phase, it is important to ensure that agencies are making the most efficient use of their financial resources through effective management practices. However, as we have previously testified, IT projects often fail—that is, even after exceeding their budget by millions of dollars and delaying the schedule by years, the result does not meet requirements.[2]

Recognizing the severity of issues related to government-wide management of IT, in December 2014, Congress enacted federal IT acquisition reform legislation (commonly referred to as the *Federal*

[1]A "major IT investment" is a system or an acquisition that requires special management attention because it has significant importance to the mission or function of the government; significant program or policy implications; high executive visibility; high development, operating, or maintenance costs; an unusual funding mechanism; or is defined as major by the agency's capital planning and investment control process.

[2]GAO, *Information Technology: Additional Actions and Oversight Urgently Needed to Reduce Waste and Improve Performance in Acquisitions and Operations,* GAO-15-675T (Washington, D.C.: June 10, 2015).

Information Technology Acquisition Reform Act, or FITARA),[3] which states that the Office of Management and Budget (OMB) is to require in its annual IT capital planning guidance that each covered agency[4] chief information officer (CIO) certify that IT investments are adequately implementing incremental development, which OMB defines as the planned and actual delivery of new or modified technical functionality to users that occurs at least every 6 months for development of software or services.[5]

Further, in February 2015, we added improving the management of IT acquisitions and operations to our High Risk list—a list of agencies and program areas that are high risk due to their vulnerability to fraud, waste, abuse, and mismanagement, or are in need of transformation.[6] In introducing this risk area, we specifically noted that agencies' implementation of incremental development was low and called on agencies to improve their delivery of functionality.

This report responds to your request that we review agencies' use of incremental development in managing major IT investment projects. Our objectives were to (1) describe the number of major IT investments primarily in development identified on the IT Dashboard[7] as reporting the delivery of functionality every 6 months; (2) assess selected departments' and investments' delivery of incremental functionality and determine the factors affecting delivery rates; and (3) assess the quality and completeness of selected departments' plans to employ incremental development practices.

[3]*Federal Information Technology Acquisition Reform* provisions of the *Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for Fiscal Year 2015*, Pub. L. No. 113-291, div. A, title VIII, subtitle D, 128 Stat. 3292, 3438-3450 (Dec. 19, 2014).

[4]The term "covered agency" refers to the 24 major agencies listed in the Chief Financial Officers Act of 1990. 31 U.S.C. § 901(b).

[5]Office of Management and Budget, *Management and Oversight of Federal Information Technology*, Memorandum M-15-14 (Washington, D.C.: June 10, 2015).

[6]GAO, *High Risk Series: An Update*, GAO-15-290 (Washington, D.C.: Feb. 11, 2015).

[7]In June 2009, OMB established a public website (referred to as the IT Dashboard) that provides detailed information on major IT investments at 27 federal agencies. https://itdashboard.gov/

To address our first objective, we analyzed the data for major IT investments reported on the IT Dashboard as being 50 percent or more in development, modernization, and enhancement as of August 31, 2015, and determined the number of investments and associated projects that reported planned delivery of functionality every 6 months for fiscal year 2016.[8]

To address our second objective, we selected the seven departments with at least 12 investments that were reported as being 50 percent or more in development for fiscal year 2015. These were the Departments of Commerce (Commerce), Defense (Defense), Education (Education), Health and Human Services (HHS), Homeland Security (DHS), Transportation (Transportation), and the Treasury (Treasury). We then analyzed the departments' delivery and planned delivery of useable functionality of major IT investments and associated software development-related projects for fiscal years 2015 and 2016 using a data collection instrument. For each project, we determined what time frames useable functionality was being delivered or planned to be delivered, the definition of useable functionality being used, and the department's reason if functionality was not being delivered or planned to be delivered every 6 months. We also conducted a random sample of department projects to verify the reported delivery rates and found that the data is sufficiently reliable for the purpose of this report.

To address our third objective, we analyzed the seven selected departments' policies and plans for implementing CIO certification of adequate incremental development to determine whether the policies are consistent with OMB guidance on FITARA. We also interviewed staff from OMB's Office of E-Government and Information Technology regarding OMB guidance in this area. Details of our objectives, scope, and methodology are contained in appendix I.

We conducted this performance audit from April 2015 to August 2016, 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

[8]We made the decision to select August 31, 2015 because it was the final day updated data would be publicly available before OMB discontinued updates of the IT Dashboard until the President's Budget for fiscal year 2017 was released in February 2016.

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

Investments in IT have the potential to make agencies more efficient in fulfilling their mission. However, as we have previously reported, investments in federal IT too often result in failed projects that incur cost overruns and schedule slippages while contributing little to the mission-related outcome. For example:

- Defense's Expeditionary Combat Support System was canceled in December 2012, after spending more than a billion dollars and failing to deploy within 5 years of initially obligating funds.[9]
- The Department of Veterans Affairs' Financial and Logistics Integrated Technology Enterprise program 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.[10]
- The Office of Personnel Management's Retirement Systems Modernization program was canceled in February 2011, after spending approximately $231 million on the agency's third attempt to automate the processing of federal employee retirement claims.[11]
- DHS's Secure Border Initiative Network program was ended in January 2011, after the department obligated more than $1 billion to

[9]GAO, *DOD Financial Management: Implementation Weaknesses in Army and Air Force Business Systems Could Jeopardize DOD's Auditability Goals,* GAO-12-134 (Washington, D.C.: Feb. 28, 2012) and *DOD Business Transformation: Improved Management Oversight of Business System Modernization Efforts Needed,* GAO-11-53 (Washington, D.C.: Oct. 7, 2010).

[10]GAO, *Information Technology: Actions Needed to Fully Establish Program Management Capability for VA's Financial and Logistics Initiative*, GAO-10-40 (Washington, D.C.: Oct. 26, 2009).

[11]GAO, *Office of Personnel Management: Retirement Modernization Planning and Management Shortcomings Need to Be Addressed,* GAO-09-529 (Washington, D.C.: Apr. 21, 2009); and *Office of Personnel Management: Improvements Needed to Ensure Successful Retirement Systems Modernization*, GAO-08-345 (Washington, D.C.: Jan. 31, 2008).

the program, because it did not meet cost-effectiveness and viability standards.[12]

- The tri-agency's (National Oceanic and Atmospheric Administration, Defense, and the National Aeronautics and Space Administration) National Polar-orbiting Operational Environmental Satellite System was a weather satellite program that was cancelled by the White House Office of Science and Technology Policy in February 2010 after the program spent 16 years and almost $5 billion.[13]
- The Department of Veterans Affairs' Scheduling Replacement Project was terminated in September 2009 after spending an estimated $127 million over 9 years.[14]

One approach to reducing the risks from broadly-scoped, multiyear projects is to divide investments into smaller parts—an incremental development technique recognized in prior law since 1996 and OMB guidance.[15] By following this approach, agencies have the potential to

- deliver capabilities to their users more rapidly, giving them more flexibility to respond to changing agency priorities;
- increase the likelihood that each project will achieve its cost, schedule, and performance goals;

[12]GAO, *Secure Border Initiative: DHS Needs to Strengthen Management and Oversight of Its Prime Contractor,* GAO-11-6 (Washington, D.C.: Oct. 18, 2010); *Secure Border Initiative: DHS Needs to Reconsider Its Proposed Investment in Key Technology Program*, GAO-10-340 (Washington, D.C.: May 5, 2010); and *Secure Border Initiative: DHS Needs to Address Testing and Performance Limitations That Place Key Technology Program at Risk*, GAO-10-158 (Washington, D.C.: Jan. 29, 2010).

[13]GAO, *Polar-Orbiting Environmental Satellites: With Costs Increasing and Data Continuity at Risk, Improvements Needed in Tri-agency Decision Making*, GAO-09-564 (Washington, D.C.: Jun 17, 2009) and *Environmental Satellites: Polar-orbiting Satellite Acquisition Faces Delays; Decisions Needed on Whether and How to Ensure Climate Data Continuity*, GAO-08-518 (Washington, D.C.: May 16, 2008).

[14]GAO, *Information Technology: Management Improvements Are Essential to VA's Second Effort to Replace Its Outpatient Scheduling System,* GAO-10-579 (Washington, D.C.: May 27, 2010).

[15]See *Clinger-Cohen Act of 1996*, Pub. L. No. 104-106 § 5202(a), 110 Stat. 690 (1996), codified at 41 U.S.C. § 2308; see also 48 C.F.R. § 39.103 (Federal Acquisition Regulation); Office of Management and Budget, *Management of Federal Information Resources*, Circular No. A-130 Revised.

- obtain additional feedback from users, increasing the probability that each successive increment and project will meet user needs;
- more easily incorporate emerging technologies; and
- terminate a poorly performing investment, with fewer sunk costs.

Since 2000, OMB Circular A-130 has directed agencies to incorporate an incremental development approach into their policies and ensure that investments implement them.[16] And, since 2012, OMB has required that functionality be delivered at least every 6 months.[17]

In May 2014, OMB issued its fiscal year 2016 capital planning guidance, which required agencies to report whether each major IT investment project[18] produced useable functionality in their exhibit 300 for fiscal year 2016 by asking agencies to report on the status of a release every 6 months.[19] An exhibit 300 provides a business case for each major IT investment within the federal government, including cost, schedule, and performance information on each investment's projects. OMB uses the exhibit 300s to monitor these investments once they are funded. Performance information on each major IT investment, including the status of incremental delivery, is also publicly reported on the IT Dashboard. OMB uses the IT Dashboard to provide transparency and oversight into these agencies' investments. This public display of data is also intended to allow Congress and government oversight bodies, as well as the general public, to hold agencies accountable for the results and progress of the investments.

[16]Office of Management and Budget, *Management of Federal Information Resources*, Circular No. A-130 Revised. OMB's 2012 and 2013 guidance reaffirmed and strengthened these requirements. Executive Office of the President of the United States, OMB, *Fiscal Year 2014 Analytical Perspectives: Budget of the U.S. Government, 354*; and OMB, *Contracting Guidance to Support Modular Development* (June 14, 2012).

[17]Office of Management and Budget, *FY2016 IT Budget–Capital Planning Guidance* (Washington, D.C.: May 23, 2014); *Guidance on Exhibits 53 and 300—Information Technology and E-Government* (2013); *Guidance on Exhibits 53 and 300—Information Technology and E-Government* (2012).

[18]An IT investment may include one or more projects that are to develop, modernize, enhance, or maintain a single IT asset or group of IT assets with related functionality.

[19]Office of Management and Budget, *FY2016 IT Budget – Capital Planning Guidance.*

As noted earlier, in December 2014, FITARA was enacted, which states that OMB is to require in its annual IT capital planning guidance that covered agency CIOs certify that IT investments are adequately implementing OMB's incremental development guidance.[20] Accordingly, in June 2015, OMB released guidance that requires agencies to conduct a self-assessment and submit a plan describing the changes they will make to ensure that they meet the requirements under FITARA, including defining IT processes and policies for their department that ensure that the CIO certifies that IT resources are adequately implementing incremental development.[21] After the plans were approved by OMB, the agencies posted these plans on their websites.

Further, OMB also issued its fiscal year 2017 capital planning guidance in June 2015. This guidance requires agency CIOs to certify in each major IT investment exhibit 300 whether the investment's plan for the current year adequately implements incremental development.[22]

GAO Has Reported on Efforts to Improve IT Acquisitions Using Incremental Development

During the past several years, we have reported on a variety of issues related to improving IT acquisitions throughout the federal government through the use of modular or incremental development. For example, in 2011, we identified seven successful investment acquisitions and nine common factors critical to their success.[23] Specifically, we reported that department officials had identified seven successful investment acquisitions that best achieved their respective cost, schedule, scope,

[20]40 U.S.C. § 11319(b)(1)(B)(ii).

[21]Office of Management and Budget, *Management and Oversight of Federal Information Technology*, Memorandum M-15-14.

[22]Office of Management and Budget, *FY2017 IT Budget–Capital Planning Guidance* (Washington, D.C.: June 16, 2015).

[23]GAO, *Information Technology: Critical Factors Underlying Successful Major Acquisitions*, GAO-12-7 (Washington, D.C.: Oct. 21, 2011).

and performance goals.[24] Notably, all of these were smaller increments, phases, or releases of larger projects. For example, the Defense investment in our sample was the seventh increment of an ongoing investment; the Department of Energy's system was the first of two phases; the DHS investment was rolled out to two locations prior to deployment to 37 additional locations; and Transportation's investment had been part of a prototype deployed to four airports.

Common factors critical to the success of three or more of the seven investments were (1) program officials were actively engaged with stakeholders, (2) program staff had the necessary knowledge and skills, (3) senior department and agency executives supported the programs, (4) end users and stakeholders were involved in the development of requirements, (5) end users participated in testing system functionality prior to formal end user acceptance testing, (6) government and contractor staff were stable and consistent, (7) program staff prioritized requirements, (8) program officials maintained regular communication with the prime contractor, and (9) programs received sufficient funding. These critical factors support OMB's objective of improving the management of large-scale IT acquisitions across the federal government, and wide dissemination of these factors could complement OMB's efforts.

[24]The seven investments were (1) Department of Commerce Decennial Response Integration System; (2) Defense Global Combat Support System Joint (Increment 7); (3) Department of Energy Manufacturing Operations Management Project; (4) the Department of Homeland Security Western Hemisphere Travel Initiative; (5) the Department of Transportation Integrated Terminal Weather System; (6) Treasury Customer Account Data Engine 2; and (7) the Department of Veterans Affairs Occupational Health Record-keeping System.

Subsequently, in 2012, we identified 32 practices and approaches as being effective for applying incremental (Agile) software development methods[25] to IT projects.[26] Officials from five agencies who had used Agile methods on federal projects cited beneficial practices, such as obtaining stakeholder and customer feedback frequently, managing requirements, and ensuring staff had the proper knowledge and experience. We also identified 14 challenges with adapting and applying Agile in the federal environment, including agencies having difficulty with committing staff to projects, procurement practices that did not support Agile projects, and compliance reviews that were difficult to execute within an iterative time frame. We noted that the effective practices and approaches identified in the report, as well as input from others with broad Agile experience, could help agencies in the initial stages of adopting Agile.

In addition, in April 2012, we reported on OMB's efforts to implement the actions called for in its *25 Point Implementation Plan*[27] and found that it had partially completed work on two key action items relating to incremental development—issuing contracting guidance and templates to support incremental development and working with Congress to create IT budget models that align with incremental development.[28] With respect to the contracting guidance and templates, we found that, although OMB had worked with the IT and acquisition community to develop guidance, it

[25]Agile development calls for the delivery of software in small, short increments rather than in the typically long, sequential phases of a traditional waterfall approach. More a philosophy than a methodology, Agile emphasizes early and continuous software delivery, as well as using collaborative teams and measuring progress with working software, and promotes these four values: (1) individuals and interactions over processes and tools, (2) working software over comprehensive documentation, (3) customer collaboration over contract negotiation, and (4) responding to change over following a plan.

[26]GAO, *Software Development: Effective Practices and Federal Challenges in Applying Agile Methods*, GAO-12-681 (Washington, D.C.: July 27, 2012).

[27]In December 2010,the Office of Management and Budget released its 25-point plan which called for federal IT programs to deploy functionality in release cycles no longer than 12 months, and ideally, less than 6 months. The plan also identified key actions that can help agencies implement this incremental development guidance, such as working with Congress to develop IT budget models that align with incremental development, and issuing contracting guidance and templates to support incremental development.

[28]GAO, *Information Technology Reform: Progress Made; More Needs to Be Done to Complete Actions and Measure Results*, GAO-12-461 (Washington, D.C.: Apr. 26, 2012).

had not yet issued this guidance or the templates. Regarding the IT budget models, we found that, although OMB had worked to promote ideas for IT budget flexibility (such as revolving funds) with congressional committees, there had not yet been any new legislation to create additional budget flexibilities, and OMB had not identified options to increase transparency for programs that would fall under these budgetary flexibilities. We recommended that the Director of OMB ensure that all action items called for in the plan be completed. OMB agreed with this recommendation and issued contracting guidance for incremental development.

In May 2014, we reported on the status of incremental development at five agencies (Defense, HHS, DHS, Transportation, and Department of Veterans Affairs) and found that these agencies planned to deliver functionality in fewer than half of the investments in 12-month cycles and only about one-fourth of these investments would deliver in 6-month increments, as required by OMB.[29] Additionally, OMB staff reported to us that they did not expect that many investments would meet the 6-month requirement. We, therefore, questioned whether a 6-month delivery requirement was an appropriate government-wide goal and whether OMB should instead consider a 12-month time frame, as called for in its *IT Reform Plan*. Accordingly, we recommended that OMB require projects to deliver functionality at least every 12 months. OMB disagreed with our recommendation, asserting that changing the requirement from 6 to 12 months would reduce the emphasis on incremental development that it had been advocating and that 6 months was an appropriate goal.

We also recommended that OMB develop and issue clearer guidance on incremental development to ensure that OMB has the necessary information to oversee the extent to which projects and investments are implementing its guidance. OMB took action to address this second recommendation and issued capital planning guidance in fiscal year 2016 that requires agencies to report on whether each of its projects has delivered a production release every 6 months and provide a rationale if functionality is not being delivered. In addition, we recommended that selected agencies update and implement their associated policies. Most

[29]GAO, *Information Technology: Agencies Need to Establish and Implement Incremental Development Policies*, GAO-14-361 (Washington, D.C.: May 1, 2014).

agencies agreed with our recommendations or had no comment but as of August 2016, only the Departments of Homeland Security, Transportation, and Veterans Affairs have addressed our recommendations.

Most recently, in February 2015, we added improving the management of IT acquisitions and operations to our High Risk list,[30] citing a lack of disciplined and effective management and inconsistent application of best practices to the successful acquisition of IT projects throughout the federal government. In particular, we noted the critical importance of implementing incremental development in order to reduce investment risk and called on federal agencies to ensure that a minimum of 80 percent of the government's major acquisitions should deliver functionality at least every 12 months.

Federal Agencies Reported Sixty-Four Percent of Projects Are to Deliver Functionality Every Six Months for Fiscal Year 2016

OMB's fiscal year 2016 capital planning guidance requires all projects for major IT investments to produce useable functionality at least every 6 months.[31] In addition, all federal departments and agencies that have a major IT investment are required to provide information on the investment on the IT Dashboard, including: the CIO's assessment of the current investment risk level; the number of projects for the investment; each project's current status; the amount of current year fiscal funding allocated to development, modernization, and enhancement or operations and maintenance activities; and whether the project produces useable functionality. Specifically, all departments and agencies are required to indicate either a "yes," "no," or "not applicable" regarding whether the project has delivered a release (i.e. delivered functionality) every 6 months and provide a rationale if functionality is not being delivered. This is generally applicable to software development projects only, according to OMB's definition of useable functionality issued in fiscal year 2016 guidance, which defines it as any change to an IT system that primarily provides new or improved capability to the end user, not including

[30]GAO-15-290.

[31]Office of Management and Budget, *FY2016 IT Budget–Capital Planning Guidance*.

modifications such as security patching or strengthened backup processes.[32]

As of August 31, 2015 on the IT Dashboard, 22 federal departments and agencies reported a total of 169 major IT investments that were planned to be primarily in development[33] for fiscal year 2016.[34] These 169 investments were comprised of 469 active software development projects; 300 of these projects (approximately 64 percent) reported plans to deliver useable functionality every 6 months. Table 1 lists the total number and percent of federal department and agency software development projects that reported plans to deliver functionality for fiscal year 2016, from highest to lowest.

Table 1: Federal Agency Software Development Project Plans to Deliver Functionality Every 6 Months for Fiscal Year 2016, as Reported on the IT Dashboard

Department/agency	Number of major IT investments	Number of projects associated with investments	Number of projects planning delivery of release every 6 months	Percent planning release every 6 months
Department of Veterans Affairs	10	95	95	100%
Department of Commerce	9	84	78	93%
Department of Health and Human Services	18	48	42	88%
Department of Education	12	14	11	79%
Department of the Treasury	12	28	18	64%
Department of Homeland Security	13	23	13	57%

[32]Office of Management and Budget, *FY16 Capital Planning Guidance Addendum: IDC Common Definitions* (Washington, D.C.: May 23, 2014).

[33]An investment is considered to be primarily in development if at least 50 percent of fiscal year funding is allocated to development, modernization, and enhancement.

[34]We made the decision to select August 31, 2015 because it was the final day updated data would be publicly available before OMB discontinued updates of the IT Dashboard until the President's Budget for fiscal year 2017 was released in February 2016.

Department/agency	Number of major IT investments	Number of projects associated with investments	Number of projects planning delivery of release every 6 months	Percent planning release every 6 months
Social Security Administration	9	24	12	50%
Department of Transportation	20	60	5	8%
Department of Defense	36	51	4	8%
All other federal agencies[a]	30	42	22	52%
Total	**169**	**469**	**300**	**64%**

Source: GAO analysis of IT Dashboard data as of August 31, 2015. I GAO-16-469

[a]Thirteen additional departments and agencies had at least one major IT investment and a total of 20 or fewer projects. These agencies have been totaled together because calculating a percent of functionality delivered for a small number of projects does not provide a reliable figure.

The total governmentwide percentage of delivered functionality was significantly different across the federal agencies. In particular, 5 agencies have 338 (approximately 72 percent) of the 469 software development projects that we examined. Three of these agencies have some of the highest percentages of functionality delivered among the federal government (over 75 percent), while the other 2 agencies have the lowest percentage of reported delivery (under 20 percent). Combined, these 5 agencies' reported delivery largely determines the total governmentwide percentage. See appendix II for the status of incremental delivery as reported by the 22 federal departments and agencies.

Regarding the 169 projects (or 36 percent) that federal departments and agencies reported were not planning delivery of functionality every 6 months, agencies provided a variety of explanations for not meeting that requirement, including project complexity, the lack of an established project release schedule, or that the project was not a software development project. For example,[35]

[35]These numbers do not add up to 169 because the explanations given could fit into one or more of these examples.

- "No" or "not applicable" was reported for 65 projects, with the explanation that the project delivered functionality according to an approved acquisition schedule.
- "No" was reported for 34 projects with the rationale that the project was not a software development project or just included hardware upgrades or maintenance updates.
- "No" was reported for 22 projects with the explanation that, due to the project's complexity, requirements, scope, or other factors, delivering every 6 months was not feasible.
- "No" or "not applicable" was reported for 20 projects indicating that the project was in the planning stage or not yet operational.
- "No" was reported for 15 projects with the explanation that the project only provided support or assistance for another project.
- "No" was reported for 7 projects with the rationale that a project release schedule or delivery date had not yet been determined.
- "Not applicable" was reported for 76 projects and 43 of those did not provide a rationale for why this rating was selected.
- 10 projects did not provide any response as to whether or not the project delivered functionality, even though OMB guidance requires agencies to respond to the question in the business case.

While OMB's guidance states that all federal department and agency projects for major IT investments are required to deliver functionality at least every 6 months, staff from the OMB Office of E-Government and Information Technology noted that not all projects would benefit or fit into an incremental delivery model. According to the staff, this is because the CIOs require discretion in choosing the best software solution for agency needs. The staff further stated that OMB's strategy was to ensure transparency by requiring agencies to make this information available online to enable the public to hold them accountable. The staff confirmed that language had not been included in its guidance related to what would be considered acceptable for not delivering functionality because each investment is unique and agencies have unique requirements. However, OMB staff said a "not applicable" response would be acceptable if the project is not a software project, but that it would prefer departments be more explicit with their response and state whether it is or is not a software development project. In addition, staff also said that there were no other reasons that would be acceptable for a "not applicable" response, with an exception for a project not being software development.

While we acknowledge the issues OMB staff have raised, what OMB staff have cited as acceptable deviations from the use of incremental development do not align with OMB policy that incremental must be used for all major IT investments. In particular, OMB policy does not clearly outline the types of projects where the use of incremental development would not be appropriate and how departments and agencies should report the status of these non-software development projects.

Going forward, staff from the OMB Office of E-Government and Information Technology reported that departments and agencies will be required to use the previously-mentioned Agile software development framework for projects, which will be outlined in guidance being developed by OMB. According to the staff, as part of this guidance, agency CIOs will need to review each software development project to be certain that an Agile approach was considered. OMB staff stated that, as of August 2016, the Agile guidance was currently under review but did not know when it would be finalized. This new guidance, once finalized, has the potential to address agency confusion about non-software development projects and increase the use of incremental development practices across the federal government. However, until clear guidance is issued on how non-software development projects should be reported, the IT Dashboard may continue to contain inconsistent department and agency data on incremental delivery.

Approximately Half of Selected Projects Reported Delivery of Functionality Every Six Months and Slightly More Than Three-Quarters Every Year

A review of seven selected departments' current software development projects found that the rate at which those departments reported their projects to us as having delivered functionality every 6 months was 45 percent for fiscal year 2015, and 55 percent for planned delivery in fiscal year 2016. However, there are significant differences between the delivery rates these departments reported to us and what they reported on the IT Dashboard. This was due to inconsistencies in reporting non-software development projects, the timing of reporting data, and a lack of support from four departments for reported delivery rates based on a review of sampled projects, particularly Defense.[36] As a result of this lack of support, the percentage of useable functionality delivered for these departments may be lower than reported. Lastly, two factors continue to impact the delivery of functionality— management and organizational challenges that affected 6-month delivery time frames, and department projects where 6-month incremental development may not be appropriate.

Projects Reported Delivering Functionality Every Six Months Less Than Half the Time

The seven departments we reviewed reported that the percentage of software development projects that delivered functionality every 6 months was 45 percent for fiscal year 2015 and 55 percent for planned delivery in fiscal year 2016. However, reported delivery of functionality every 12 months was significantly higher. Specifically, the seven departments we reviewed reported that more than 75 percent of their projects delivered functionality at least once a year for fiscal year 2015 and planned to deliver similar results for fiscal year 2016. For more details on the seven departments' delivery of functionality, see appendix III.

Fewer than half of selected projects delivered functionality every six months in fiscal year 2015

The seven departments in our review reported to us that 129 active software development projects (45 percent), out of a total of 287, delivered functionality every 6 months, as required by OMB. Of the 287 projects, 221 (77 percent) reported delivering useable functionality every 12 months. Table 2 shows departments' software development delivery by number and percentage for fiscal year 2015, as reported to us.

[36]Defense did not provide all the requested information in time to be included in our review, and so we could not verify the department's reported delivery rates for a sample of projects.

Table 2: Selected Departments' Software Development Projects and Reported Percent Delivering Functionality in Fiscal Year 2015, as Reported to GAO

Department	Total number of projects	Number every 6 months	Percent every 6 months	Number every 12 months	Percent every 12 months
Commerce	**84**	25	30%	56	67%
Defense	**41**	24	59%	35	85%
Education	**19**	9	47%	14	74%
Health and Human Services	**58**	43	74%	55	95%
Homeland Security	**21**	9	43%	13	62%
Transportation	**27**	8	30%	15	56%
Treasury	**37**	11	30%	33	89%
Total	**287**	**129**	**45%**	**221**	**77%**

Source: GAO analysis of department data. | GAO-16-469

Slightly more than half of selected projects are to deliver functionality every six months during fiscal year 2016

Overall, the departments in our review reported to us that 113 (55 percent) out of 206 software projects will deliver functionality every 6 months in fiscal year 2016, an increase of 10 percentage points from fiscal year 2015. The total number of projects changed from 287 in fiscal year 2015 to 206 for fiscal year 2016 because 86 projects were completed in fiscal year 2015 and 5 projects were started in fiscal year 2016. In addition, six of the seven departments (Commerce, Defense, Education, HHS, DHS, and Treasury) reported an increased rate of 6-month functionality delivery from fiscal years 2015 to 2016, while Transportation reported a small decrease in delivered functionality. There was also a small increase of 5 percentage points from fiscal year 2015 in the number of projects that will deliver functionality every 12 months. Table 3 shows a breakdown of departments' software development delivery rate by number and percentage for fiscal year 2016, as reported to us.

Table 3: Selected Departments' Software Development Projects and Reported Percent of Planned Delivery of Functionality in Fiscal Year 2016, as Reported to GAO

Department	Total number of projects	Number every 6 months	Percent every 6 months	Number every 12 months	Percent every 12 months
Commerce	**67**	34	51%	56	84%
Defense	**38**	24	63%	30	79%
Education	**6**	4	67%	6	100%
Health and Human Services	**36**	28	78%	36	100%
Homeland Security	**18**	11	61%	16	89%
Transportation	**24**	6	25%	14	58%
Treasury	**17**	6	35%	10	59%
Total	**206**	**113**	**55%**	**168**	**82%**

Source: GAO analysis of department data. | GAO-16-469

Information Reported by Selected Departments on the IT Dashboard Varied Significantly from Data Reported to Us

The number of software development projects and delivery of functionality reported by the seven departments on the IT Dashboard for fiscal year 2016 was significantly different than what the departments reported to us. Specifically, the subset of the 7 departments in our review reported a total of 308 active projects on the IT Dashboard. However, these departments reported to us that they only had 206 active software projects. Table 4 ranks the seven departments' reported plans to deliver functionality on the IT Dashboard from highest to lowest, and compares those plans with the delivery plans they reported to us.

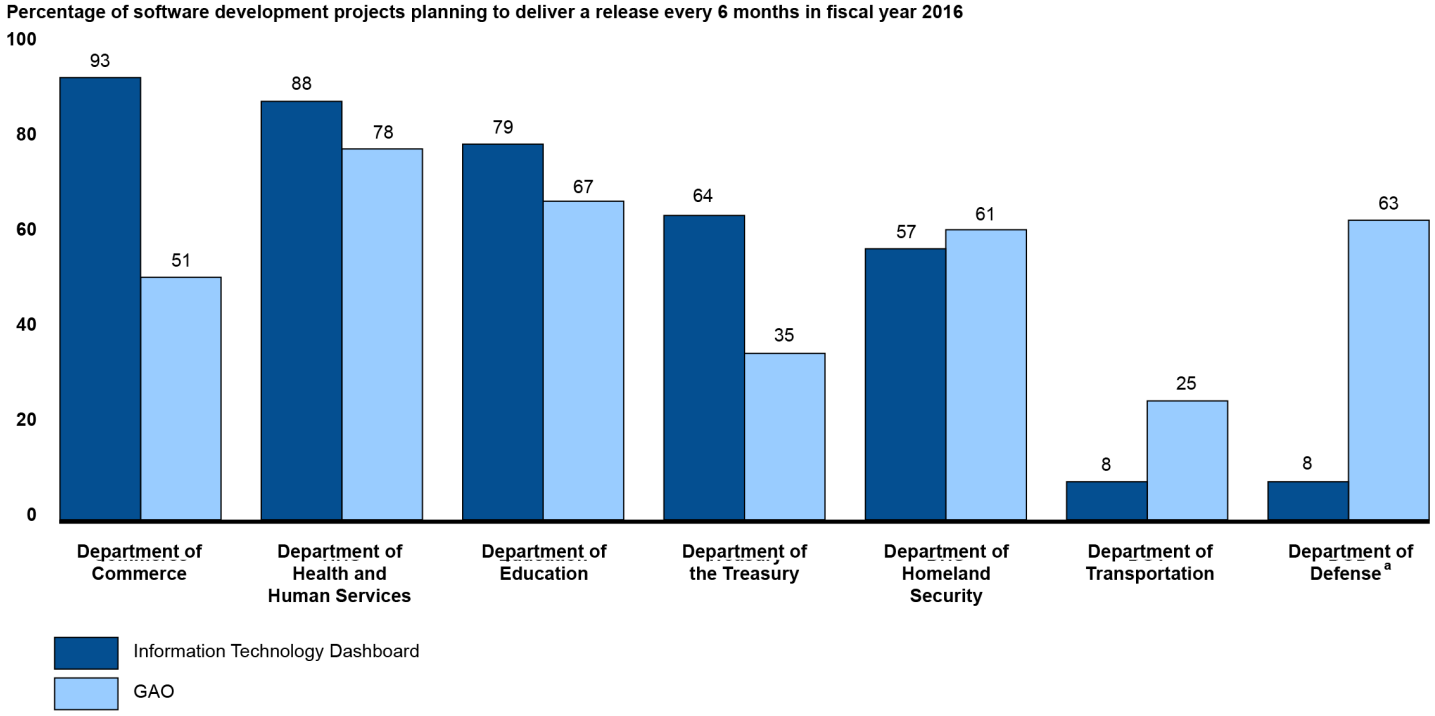
Table 4: Comparison of Software Development Projects Planning to Deliver a Release Every Six Months Reported on IT Dashboard and to GAO for Fiscal Year 2016

	Reported on IT Dashboard		Reported to GAO	
Department	Number of projects	Number of projects planning to deliver a release	Number of projects	Number of projects planning to deliver a release
Commerce	84	78	67	34
Health and Human Services	48	42	36	28
Education	14	11	6	4
Treasury	28	18	17	6
Homeland Security	23	13	18	11
Transportation	60	5	24	6
Defense	51	4	38	24
Total	**308**	**171**	**206**	**113**

Source: GAO analysis of IT Dashboard data as of August 31, 2015 and department data. | GAO-16-469

Each of the seven departments also reported a different percent of planned 6-month delivery of functionality than what was reported on the IT Dashboard. In four cases (Commerce, Education, HHS, and Treasury), the percentage of delivery reported to us decreased by at least 10 percentage points from what was reported on the IT Dashboard. This was most notable for Commerce, where there was about a 42 percentage point decrease. The other three departments (Defense, DHS, and Transportation) reported an increase of at least 4 percentage points, though Defense reported a 55 percentage point increase from what was reported on the IT Dashboard. Figure 1 compares what the seven departments reported on the IT Dashboard from highest to lowest and the percentages they reported to us.

Figure 1: Comparison of Software Development Projects' Percentage of Planned Delivery Every Six Months Reported on IT Dashboard and to GAO for Fiscal Year 2016



Source: GAO analysis of department data. | GAO-16-469

[a]Defense did not provide the requested information in time to verify the information reported for a sample of projects.

One reason for the discrepancy between the reported delivery rates on the IT Dashboard and the delivery rates reported by the departments to us can be partly attributed to a difference in the number of software projects. Specifically, we identified fewer software development projects than were identified on the IT Dashboard. All seven departments reported to us that some projects were actually for project administration, architectural reviews, contractor support, information assurance, or other support activities, and did not include software development. In addition, Education, Defense, and Transportation reported that several projects involved the acquisition and deployment of hardware and other infrastructure like servers, data centers, radios, or runway lights. However, as we noted earlier, our review of projects reported on the Dashboard found that departments and agencies did not always consistently report whether the project was a software development project or not due to unclear OMB guidance, resulting in data that were not always accurate.

Another reason for the discrepancy is that information reported to us was generally more current than the information reported on the IT Dashboard. In particular, officials from the Office of the CIO from four of the seven departments in our review (Defense, Education, DHS, and HHS) stated that the departments were required to report this information on the IT Dashboard in September 2014, while the information provided to us was more current (i.e., reported between July and December 2015). One department official from Defense's Office of the CIO stated that our review led the department to identify projects that were delivering functionality every 6 months that had not been included on the IT Dashboard. Another department official from HHS's Office of the CIO stated that there could be a delay in reporting of project information to the IT Dashboard and that projects might have been completed but not reported as completed or had finalized their project data but not yet reported this to the IT Dashboard.

In addition, three departments (DHS, HHS, and Treasury) reported that certain projects were terminated or cancelled during the period of our review and so did not deliver functionality. DHS officials in the Office of the CIO reported that one project had been terminated because the scope and requirements of the project were too large and complex for the contractor. Officials from HHS's Office of the CIO reported that two of its projects had been terminated due to lack of funding and two projects were being rolled into another project. Officials from the Office of the CIO at Treasury reported that two of its projects had been cancelled because they were merging with another project, which had related activities.

Lastly, not all departments in our review provided documentation to support what they reported to us regarding the delivery of functionality for their projects that we sampled.[37] While three departments (Education, DHS, and Transportation) had documentation that useable functionality had been delivered for all sampled projects, three departments (Commerce, HHS and Treasury) only provided support for some of the projects. Defense did not provide the requested information in time to be included in our review, and so we could not verify the department's

[37]We selected a stratified random sample of 54 active software development projects to determine whether there was documentation to support the departments' reported definition of useable functionality and delivery of project functionality. More details regarding our sampling and methodology are provided in appendix I.

reported delivery rates for a sample of projects.[38] Further, two projects (out of five sampled) at Treasury that reported delivering functionality every 6 months included the initial design and development of the software project components as well as the development and testing of the components as delivered functionality. However, Treasury reported that the department was using OMB's definition of functionality, which recognizes only the rollout of new or improved capability to the end user as delivering functionality. Therefore, based on the definition, these projects were not delivering useable functionality every 6 months as the department had stated.

Officials from the Treasury Office of the CIO acknowledged this issue, but were unable to provide any additional information. Officials from the Commerce Office of the CIO confirmed that supporting documentation was not available in all cases because certain projects were internal department projects that did not have this documentation. Officials from the HHS Office of the CIO provided additional documentation but the documents did not support reported time frames for a few projects. As a result, it is not clear whether the departments actually delivered useable functionality, as they reported. Consequently, the percent of useable functionality delivered for these departments may be lower than reported.

As we have noted previously in this report, having accurate and reliable data on the status of major IT investment projects' delivery of functionality is crucial for OMB and lawmakers, as well as the public, to make decisions regarding these investments and hold departments accountable for these projects and their related IT expenditures. However, there are inconsistencies in the major IT investment project information that each of the departments reported to us versus the information provided on the IT Dashboard. By not having up-to-date project information on whether the project is a software development project and the status of delivered functionality on the IT Dashboard, these seven departments are at risk that OMB and key stakeholders may make decisions regarding

[38]We did not review a sample of projects at Defense because the department was unable to provide information on 34 of 119 projects in time to be included in our review. Information on all an agency's selected projects was necessary in order to perform a random sample. However, the other measures taken to ensure the reliability of the data Defense was able to provide, as discussed in appendix I, help to ensure those data are sufficiently reliable for the purpose of this report.

department investments without the most current and accurate information.

Two Factors Impact Departments' Delivery of Functionality

Department officials from the seven departments in our review reported that two factors continue to impact efforts to maximize the use of incremental development and deliver functionality every 6 months: (1) management and organizational challenges that affect 6-month delivery time frames, and (2) department projects where 6-month incremental development may not be appropriate.

Management and organizational issues create challenges for delivering functionality every six months

Six of the seven departments (Commerce, Defense, HHS, DHS, Transportation, and Treasury) reported that various management and organizational issues such as project holds, delays, and contractor schedules had affected delivery time frames and created challenges for delivering functionality every 6 months. Specifically,

- Four departments (Commerce, Defense, DHS, and Treasury) reported that certain projects were currently on hold or in the process of developing a revised schedule with deliverables. Commerce Office of the CIO officials reported that one project had been placed on hold while the agency worked to determine next steps. Defense Office of the CIO officials reported that one project was currently being reassessed to ensure the IT solution was cost effective and could be delivered in shorter periods of time. Officials in DHS's Office of the CIO reported that one project had been stopped in order to address technical issues and was in the process of rebaselining its schedule and that a new schedule for project deliverables would not be developed until after the end of our review. Treasury officials in the Office of the CIO reported that one project has been on hold since February 2014.
- Commerce officials reported that five projects couldn't deliver functionality because the deliverable for another related project had not been completed.
- HHS officials from the Office of the CIO reported that two projects were enhancements or interfaces for particular systems and delivery time frames were therefore dependent on integration with those systems. The delivered functionality was being coordinated with the system release schedules and so would not deliver every 6 months.
- Transportation officials from the Office of the CIO reported that two projects would not always produce deliverables every 6 months

because the contractor determined the schedule of deliverables due to the complexity and size of the project.

- Treasury officials from the Office of the CIO reported that a few projects had experienced delays that led to functionality being delivered longer than 6-month increments.

The management and organizational challenges that the departments identified were similar to those identified in our prior work on incremental development,[39] in which we noted that development schedules could be impeded by procurement schedules with contractors, or that making changes to requirements and project priorities affected delivery schedules. Although the departments in this review have made significant efforts to apply incremental development practices for their major IT investment projects, additional attention to and focus on delivering in smaller increments can help ensure that projects deliver capabilities to their users more rapidly, and reduce the risk of cost overruns and schedule slippages.

Six-month delivery time frames may not be appropriate for certain types of investments and complex projects

Six of the seven departments (Commerce, Education, Defense, HHS, Transportation, and Treasury) reported that they had certain types of investments or complex projects where they believed incremental development and a 6-month delivery schedule would not work. In particular,

- Three departments (Defense, HHS, and Treasury) reported that certain projects were transitioning to production or operations and maintenance during the period of our review and so would not deliver functionality.
- Officials from the Office of the CIO at Commerce reported that they had projects that were focused on research and prototyping and were not intended to deliver useable functionality to the end user.
- Defense officials from the Office of the CIO reported that several projects were not required to adhere to a 6-month delivery schedule due to department policy that allowed complex projects with hardware and software components to determine their own schedule for deliverables.

[39] GAO-14-361.

- Education officials from the Office of the CIO reported that purchases, downloads, and renewals of software licenses, support systems including infrastructure, minor applications, and IT components in the production environment would not be appropriate for incremental development.
- Transportation officials from the Office of the CIO noted that certain projects, particularly for the Federal Aviation Administration, like those for the Next Generation Air Transportation System which is modernizing the national airspace, were unique to the federal government and could not meet a 6-month delivery schedule. In addition, investments that depend on non-IT related deliverables that can negatively impact the schedule would not be appropriate.
- Treasury officials from the Office of the CIO reported that most infrastructure projects such as tech refresh or modernization, new operating system upgrades, and follow-on projects for modernizing applications associated with an upgrade would not be appropriate for incremental delivery.

While some of these challenges were consistent with findings in our prior incremental work[40]—specifically, that infrastructure and research-oriented investments could have unique circumstances under which a 6-month schedule might not be appropriate—these types of situations should not exclude utilizing incremental practices. Using an incremental approach helps to reduce the risk of project failure and provides benefits to users in terms of faster delivered capabilities and easier incorporation of emerging technologies. To maximize the benefits of incremental development, it remains critical that federal departments continue to improve their use of this approach and deliver functionality to reduce the risk that these multi-million dollar projects will fail to meet their stated goals.

[40]GAO-14-361.

Selected Departments Have Not Fully Implemented a Statutorily Required Incremental Practice

Provisions in FITARA, enacted in December 2014, state that in its annual IT capital planning guidance, OMB shall require covered agency CIOs to certify that IT investments are adequately implementing incremental development, as defined in the annual capital planning guidance issued by OMB.[41] Subsequent OMB guidance on FITARA implementation issued in June 2015 directs each agency CIO to define IT processes and policies for their agency that ensure that the CIO certifies that IT resources are adequately implementing incremental development, which OMB defined in the guidance.[42] In addition, OMB's fiscal year 2017 capital planning guidance, issued in June 2015, requires agency CIOs to certify that each major IT investment's plan for the current year adequately implements incremental development, which will be publicly reported on the IT Dashboard.[43]

However, although OMB's requirement has been in place since June 2015, of the seven departments we reviewed, only three departments (Commerce, DHS, and Transportation) have defined processes and policies to ensure that the department CIO will certify major IT investments are adequately implementing incremental development. Specifically, Commerce's guidance requires bureau CIOs or other accountable officials[44] to certify in writing confirming successful delivery of each incremental development activity while DHS's policy requires each investment to undergo a technical review process, which includes a step for the CIO to certify whether the project is implementing incremental delivery at least every 6 months. In addition, Transportation's policy includes the review and certification of adequate incremental development as part of the investment's review by the department's investment review board, which includes the department CIO.

[41]40 U.S.C. § 11319(b)(1)(B)(ii).

[42]Office of Management and Budget, *Management and Oversight of Federal Information Technology*, M-15-14.

[43]Office of Management and Budget, *FY2017 IT Budget – Capital Planning Guidance*.

[44]OMB staff reported that, although it is acceptable for CIOs to delegate certification responsibility, the CIO is ultimately the person responsible for certification at the department.

Officials from three departments (Education, HHS and Treasury) reported that they were in the process of updating their existing incremental development policy to address certification. Specifically,

- Officials from the Office of the CIO at Education reported the department has amended its *Life Cycle Management Framework Guide* to provide CIO certification as to whether or not IT resources are adequately implementing incremental development, and the guide is currently undergoing final review. The department expects this process to be finalized by September 2016.
- Officials from HHS's Office of the CIO acknowledged that their current policy does not include certification but the department was in the process of finalizing new enterprise performance life cycle guidance that would include a process for certification. The department however didn't have a timeframe for when the formal review would be completed.
- Treasury officials from the Office of the CIO reported the department is in the process of updating its incremental development guidance, the *Information System Life Cycle Manual*, but that the document is still in draft and will not be implemented until mid-2017. In addition, the Treasury CIO reported that he had issued a department memo regarding CIO authority under FITARA and that additional guidance would be issued, but did not provide a time frame for when this would be accomplished.

Lastly, Defense's policies that address incremental development did not include information on CIO certification. Specifically, officials from the Office of the CIO at Defense reported that its acquisition policies (Defense Directive 5000.01 and Instruction 5000.02) included information about incremental development and CIO certification. However, a review of the policies found that they do not explicitly indicate that the CIO will review all major IT investments to determine if the project applies adequate incremental development principles. Department officials stated that the department did not intend to institute a separate process for the CIO to certify incremental investments because the department believed that its existing processes were sufficient to ensure that investments were appropriately implementing incremental strategies. Defense officials further stated that their current processes were adequate for certification even if certification was not explicitly mentioned in the policies.

While OMB's FITARA guidance requires covered agency CIOs to certify whether an investment uses adequate incremental development, the guidance is not specific on how CIOs should conduct this certification. According to OMB staff from the Office of E-Government and Information

Technology, department CIOs should follow internal governance and IT capital planning for certification and should also use their best judgment as to whether the major IT investment current year plans should include incremental development and how the department should define "adequate" incremental development. OMB staff did note, however, that OMB was working with individual departments and agencies to increase their use of incremental development practices.

In addition, OMB staff reported that, although it is acceptable for CIOs to delegate certification responsibility, the CIO is ultimately the person responsible for certification at the department. Lastly, OMB staff noted that, while all major IT investments require CIO certification, certain investments do not lend themselves to incremental development, such as investments related to infrastructure or technology refreshment of equipment, and so the CIO should certify that incremental development is not applicable in those cases.

CIO certification of the use of adequate incremental development in a department's IT investments is critical to ensuring that covered agency CIOs not only have the proper authority and oversight over major IT investments, but also to ensuring that OMB and lawmakers can hold CIOs accountable for the performance of major IT investments and their deliverables. However, until all the departments we reviewed define processes and policies for the certification of the adequate use of incremental development, they will not be able to fully ensure adequate implementation of, or benefit from, incremental development practices.

Conclusions

For the last 16 years, OMB has required agencies to implement an incremental development approach for their major IT investments—and for the last 4 years, has required these major investments to deliver functionality every 6 months—in order to deliver capabilities to users more rapidly and to reduce the risk that these multi-million dollar projects will fail. While federal departments and agencies report that 64 percent of investment projects plan to deliver functionality every 6 months for fiscal year 2016 on the IT Dashboard, shortcomings with OMB guidance—specifically, the lack of clarity regarding the types of projects that should not use incremental development and how this information should be reported— has affected the accuracy of incremental data on the IT Dashboard. Forthcoming OMB guidance on Agile for software development projects may resolve this confusion for departments and agencies, but OMB has not determined when this new guidance will be finalized.

While approximately half of the software projects that we reviewed reported delivering (or planning to deliver) functionality every 6 months and slightly more than three-quarters every year, departments are not using incremental approaches to the greatest extent possible. The significant differences we identified in the data reported to us versus what is on the IT Dashboard result from inconsistencies in reporting non-software development projects, the timing of reporting data, and a lack of support for reported delivery rates, all of which affect the accuracy of reported delivery rates. It will be critical for the departments we reviewed to take action to address the consistency of their reporting. Additionally, the departments in our review reported that management and organizational challenges and the complexity and the uniqueness of projects impact their ability to deliver incrementally. While our prior work has concluded that a 6-month delivery schedule is not always suitable for an incremental approach—and OMB has confirmed not all projects fit this approach—it is still the responsibility of the departments to utilize incremental development as required by law. Delivering functionality on an incremental basis will also increase the likelihood these multi-million dollar projects will not fail.

Finally, provisions in FITARA requiring CIO certification of adequate incremental development will help to strengthen the use of incremental development practices throughout the federal government. However, four of the seven departments in our review still need to take action to finalize policies to address OMB guidance in this area. It will be critical that OMB guidance is implemented to ensure CIOs exercise the proper authority and oversight over major IT investments and OMB and Congress can hold them accountable for major IT investment performance.

Recommendations for Executive Action

In order to improve the accuracy of IT Dashboard incremental development data, we recommend that the Director of OMB direct the Federal CIO to take the following action.

- Clarify existing guidance regarding what IT investments are and are not subject to requirements on the use of incremental development and how CIOs should report the status of projects that are not subject to these requirements.

To improve the quality of the seven departments' information on project incremental delivery reported to the IT Dashboard, we recommend that the Secretaries of Commerce, Defense, Education, Health and Human

Services, Homeland Security, Transportation, and the Treasury direct their CIOs to

- review major IT investment project data reported on the IT Dashboard and update the information as appropriate in the following areas: (1) whether the project is in-progress or complete; (2) whether the project is a software development project or not; and (3) the status of the delivery of functionality every 6 months, ensuring that these data are consistent across all reporting channels.

To improve the certification of adequate incremental development, we recommend that the Secretaries of Defense, Education, Health and Human Services, and the Treasury direct their CIOs to

- establish a department policy and process for the certification of major IT investments' adequate use of incremental development, in accordance with OMB's guidance on the implementation of FITARA.

Agency Comments and Our Evaluation

We received comments on a draft of this report from OMB and the seven departments to which we made recommendations. Specifically, five departments agreed with our recommendations, Defense partially agreed with one and did not agree with another, OMB did not agree or disagree, and Treasury did not comment on our recommendations. Multiple departments also provided technical comments, which we incorporated as appropriate. The following is a detailed summary of each agency's comments.

- In comments provided via e-mail on June 23, 2016, an OMB staff member from the Office of General Counsel did not specifically agree or disagree with our recommendation, but stated that OMB generally agreed with our report. The staff member also noted that, while OMB encourages CIOs to review investments for applicability of incremental development, it would not be in the best interest of the government to prescribe what specific criteria are needed to adopt an incremental approach given the nature of some complex systems and investments. However, we have previously reported that OMB's policy does not clearly outline the types of projects where the use of incremental development would not be appropriate, such as infrastructure or research and development investments, nor does this policy detail how departments and agencies should report the status of these non-software development projects. As a result, incremental project data on the IT Dashboard are not always accurate. Until OMB issues guidance that explicitly details what investments are and are

not subject to incremental development requirements, agencies will continue to be unclear about how non-software development project data are to be reported on the Dashboard. Based on this need for clarification, we believe our recommendation to OMB is appropriate.

- In written comments, Commerce concurred with our recommendation, and stated that the department would incorporate the recommendation into its CIO dashboard reporting. Commerce also provided technical comments, which we have incorporated as appropriate. Commerce's comments are provided in appendix IV.

  Our draft report provided to Commerce for comment included a recommendation that it establish a department policy and process for the certification of major IT investments' adequate use of incremental development, in accordance with OMB's guidance on the implementation of FITARA. In its written comments, Commerce stated that in response to our recommendation, the department had updated guidance in its *Capital Planning and Investment Control Handbook* on the use, definition, and certification of incremental development in accordance with guidance issued by OMB and on the implementation of FITARA. We reviewed a copy of this guidance, dated May 16, 2016, and, as a result of Commerce's action, we have removed the recommendation from our final report.

- In written comments, Defense partially concurred with our recommendation to review major IT investment project data reported on the IT Dashboard data and to update: project status; whether the project is software development or not; and whether the project is delivering functionality every 6 months. Defense noted that it was taking action to update IT Dashboard data as appropriate, but the department asserted that it considers other factors and information from key department stakeholders in rating investments on the IT Dashboard. However, our analysis shows a significant discrepancy in the incremental data reported on the Dashboard versus the data reported to us. In particular, on the Dashboard, Defense reported that only 8 percent of its projects delivered functionality in fiscal year 2016. However, the projects that we reviewed reported a 63 percent delivery rate to us—a 55 percentage point difference. Further, the department stated that it does not require that each investment be developed incrementally and provide capability every 6 months. OMB's guidance, however, clearly states that all projects, regardless of whether they use incremental development principles, must produce usable functionality at least every 6 months. As such, it remains critical that Defense continue to improve the quality of its incremental data on the Dashboard and report the status of project compliance

with OMB guidance. Consequently, we believe our recommendation is appropriate.

In addition, the department did not concur with our recommendation to establish a department policy and process for certification of adequate incremental development in accordance with OMB's guidance on the implementation of FITARA. Specifically, the department stated that its existing acquisition system includes policy and processes defined in Defense Directive 5000.01 and Defense Instruction 5000.02 regarding the use of incremental development, which was documented in the department's approved FITARA implementation plan. However, OMB's guidance dated June 10, 2015, clearly states that each department should define processes and policies to ensure that the CIO certifies the use of adequate incremental development for its IT investments. Both policies the department refers to, DoD Directive 5000.01 and DoD Instruction 5000.02 (issued November 20, 2007, and January 7, 2015, respectively) were issued prior to OMB's guidance on FITARA (dated June 10, 2015). As we noted earlier, the department's policies do not require that the CIO review all major IT investments regarding the status of incremental development. It is important for agencies to comply with OMB's June 2015 guidance, which sets forth the CIO's roles and responsibilities in implementing a key aspect of the FITARA IT acquisition reforms regarding the certification of adequate incremental development. As we have previously noted, ensuring that CIOs appropriately consider the use of incremental development can help reduce the risk of investments delivering capabilities late and over-budget. Because Defense's policies do not address OMB's guidance in this area, we believe our recommendation is appropriate.

In its letter, the department also expressed the concern that agencies are required to report on measures and metrics via the IT Dashboard and other mechanisms that are not producing improvements in IT delivery or capability and that the time spent collecting and reporting this information could be spent conducting deeper analysis of a lesser number of key metrics. The department further calls for the government to adapt metrics from industry that are suitable and meet the government's requirements. We believe the measurement of incremental development to be a key indicator of investment performance. We have repeatedly reported and testified on the importance of using incremental development to help ensure IT investments are delivered on time and provide the required capability. Given the importance of incremental development as a key enabler of project success, OMB's requirement for investments to deliver incrementally and to publicly report compliance with this policy on the

Dashboard holds agencies accountable for the success of their investments. Further, oversight of these data remains critical given that our work found significant discrepancies between what agencies reported on the Dashboard versus what was reported to us, as detailed earlier. As such, we continue to believe such metrics and data help to improve the transparency and management of federal IT investments.

The department also did not concur with a footnote that stated that the department did not provide requested information in time to be included in our review. Specifically, the department noted that some data was delivered on time and suggested alternate language recognizing this. We have incorporated technical changes to the draft, as appropriate, to address this comment.

Finally, the department did not concur with a statement made in the draft regarding Defense officials' intention to not develop a separate process for CIO certification of adequate incremental development principles. Specifically, the department noted that a separate process was unnecessary and not cost effective, and that existing processes would meet OMB's requirement. However, as we noted previously, the existing guidance that the department refers to was issued before OMB's guidance on the implementation of FITARA and, based upon our review, does not address OMB's guidance in this area. We have incorporated technical changes to the draft, as appropriate, to address this comment. Defense's comments are provided in appendix V.

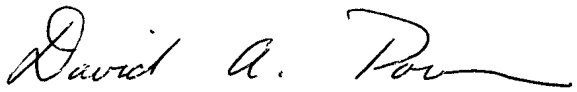
- In written comments, Education concurred with our recommendations, and stated that the department would ensure the information on the IT Dashboard is kept current and would also finalize and implement a policy for CIO certification by September 2016. Education's comments are provided in appendix VI.
- In comments provided via e-mail on June 9, 2016, a management analyst from the Department of Health and Human Services' Office of the Assistant Secretary for Legislation stated that the department concurred with our recommendation and had no other comments. HHS also provided technical comments, which we have incorporated as appropriate.
- In written comments, DHS concurred with our recommendation and stated that a component of the department's Office of the CIO would validate each DHS investment on the IT Dashboard and work to ensure that program data is appropriately updated. DHS also provided technical comments, which we have incorporated as appropriate. DHS's written comments are provided in appendix VII.

- In comments provided via e-mail on June 3, 2016, Transportation's Director of Audit Relations and Program Improvement in the Office of the Secretary stated that the department concurred with the findings and recommendations in our report.

  Our draft report provided to Transportation for comment included a recommendation that Transportation establish a department policy and process for the certification of major IT investments' adequate use of incremental development, in accordance with OMB's guidance on the implementation of FITARA. In addition to comments on the draft, the department provided a copy of *Transportation's Investment Management Process Guidance*, finalized in June 2016. The guidance includes information on the department's process for CIO certification of adequate incremental development in accordance with guidance issued by OMB and on the implementation of FITARA. We reviewed a copy of this guidance and, as a result of Transportation's action, we have removed the recommendation from our final report.
- In comments provided via e-mail on June 16, 2016, a GAO liaison from Treasury's Office of the CIO stated that the department did not have comments on the draft and did not comment on our recommendations. Treasury also provided technical comments, which we have incorporated as appropriate.

As agreed to with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to interested congressional committees; the Secretaries of Commerce, Defense, Homeland Security, Education, Health and Human Services, Transportation, and the Treasury; and the Director of the Office of Management and Budget and other interested parties. This report will also be available at no charge on our website at http://www.gao.gov.

If you or your staffs have any questions on matters discussed in this report, please contact me at (202) 512-9286 or pownerd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix VIII.



David A. Powner
Director, Information Technology
Management Issues

Appendix I: Objectives, Scope, and Methodology

Our objectives for this engagement were to (1) describe the number of major information technology (IT) investments identified on the IT Dashboard as primarily in development and reporting the delivery of functionality every 6 months; (2) assess selected departments' and investments' delivery of incremental functionality and determine the factors affecting delivery rates; and (3) assess the quality and completeness of selected departments' plans to employ incremental development practices.

To address our first objective, we obtained and analyzed major IT investment project data reported on the IT Dashboard as of August 31, 2015. We chose this date because it was the final day updated data would be publicly available before OMB discontinued its updates of the IT Dashboard until the President's Budget for fiscal year 2017 was released.[1] The IT Dashboard updates resumed on February 25, 2016, which would have been too late to allow us to complete this analysis in time to be published in this report.

Initially, we analyzed the data of major IT investment projects that were planning to allocate 50 percent or more to development, modernization, and enhancement activities for fiscal year 2016, which was the first year the Office of Management and Budget (OMB) required agencies to report this information. We then determined the total number of investment projects for each agency reporting a production release every 6 months, identifying a total of 169 major IT investments and 545 active projects. We then excluded 76 projects from the total count where an agency reported that a production release was not applicable because it was not a software development project. We also reviewed and summarized agency responses reported on the IT Dashboard for projects that did not deliver functionality every 6 months.

For our second objective, we selected the seven departments reporting a minimum of 12 investments at least 50 percent or more in development

[1]We have previously reported that because OMB does not update the IT Dashboard during the formulation of the President's budget request (normally from September to February), OMB has decreased the utility of the Dashboard as a tool for oversight and transparency of major IT investments. See GAO, *IT Dashboard: Agencies Are Managing Investment Risk, but Related Ratings Need to Be More Accurate and Reliable*, GAO-14-64 (Washington, D.C.: Dec. 12, 2013) for more details.

on the IT Dashboard for fiscal year 2015: the Departments of Commerce (Commerce), Defense (Defense), Education, Health and Human Services (HHS), Homeland Security (DHS), Transportation, and the Treasury. We compiled a list of each department's major IT investment projects that were in progress as of October 1, 2014, (fiscal year 2015) using data obtained from the IT Dashboard as of April 1, 2015. We asked each department's Office of the Chief Information Officer (CIO) to confirm the accuracy and completeness of the list of projects for fiscal years 2015 and 2016 and to make corrections where needed, including identifying any projects that were not software development or had been completed prior to October 1, 2014. We excluded: (1) 206 non-software development projects because the delivery of useable functionality[2] would generally not be applicable to non-software development projects and (2) 114 projects which departments confirmed were outside the scope of our review.

We then administered a data collection instrument to each of the seven departments from June to August 2015 to obtain information on the departments' delivery and planned delivery of useable functionality during fiscal years 2015 and 2016. We prepopulated these instruments with each department's verified list of projects and asked officials to indicate for each project either a "yes," "no," or "not applicable" regarding whether they planned to deliver functionality in the first half and second half of fiscal years 2015 and 2016.[3] We also asked each of the projects to provide a rationale for a "no" or "not applicable" response and to identify what definition of useable functionality the project was using (i.e., OMB's definition, an agency definition, an operating level definition, an investment definition, a project definition, or not defined).

Using the information obtained through the data collection instruments, we determined the extent to which each major IT investment project

[2]The Office of Management and Budget defines useable functionality as any changes to an IT system that primarily provides new or improved capability to the end user. This may include interface changes or improved user experience. Modifications that only improve a non-user-facing element (such as security patching or strengthened backup processes) should not be included.

[3]Departments were asked to confirm whether each project delivered functionality during the following four time periods: (1) the first half of fiscal year 2015 (i.e. from October 1, 2014, to March 31, 2015); (2) the second half of fiscal year 2015 (i.e. April 1, 2015, to September 30, 2015); (3) the first half of fiscal year 2016; and (4) the second half of fiscal year 2016.

planned to meet OMB's guidance on incremental development. To assess whether projects planned to deliver functionality every 6 months, we analyzed the responses for each of the four time periods and totaled the number of projects reporting "yes" for both time periods in fiscal year 2015 and both time periods in fiscal year 2016. We also assessed whether the projects planned to deliver functionality every 12 months because our prior work on incremental development noted that a 6-month delivery time frame may not be appropriate for all types of investments and a 12-month time frame might be more appropriate as a starting point.[4] For this assessment, we totaled the number of projects reporting a "yes" at least once in either half of fiscal year 2015 and at least once in either half of fiscal year 2016.

To minimize errors that might occur from respondents interpreting our instrument differently from our intended purpose, we pretested the data collection instrument in person and by phone in three rounds of testing with officials from the Office of the CIO at three departments (Commerce, HHS, and DHS). The selection of the departments for pretesting was based on department availability to assist us with pretesting and variation in the number of investment projects among the departments. During these pretests, we asked department officials to complete the instrument as we observed the process. We then interviewed the respondents to ascertain whether the instructions and column labels were applicable, clear, unambiguous, and easy to understand.

All departments completed the data collection instrument by August 2015 except Defense.[5] Once all department responses were received, we reviewed the responses and followed up with department officials to clarify the responses as needed. We also interviewed officials in the Office of the CIO at each selected department to obtain information on department policies and other guidance related to incremental development. We presented our results to each department and solicited their input and explanations for the results in March 2016. Six departments (Commerce, Defense, Education, HHS, DHS, and

[4]GAO, *Information Technology: Agencies Need to Establish and Implement Incremental Development Policies*, GAO-14-361 (Washington, D.C.: May 1, 2014).

[5]Defense provided data on 42 projects in December 2015, 43 projects in January 2016, and 34 projects in April 2016.

Transportation) asserted that additional projects were not software development projects or provided updated information on the status of delivered functionality, which we have incorporated as appropriate.

To help determine the reliability of the data provided in the data collection instrument, we selected a stratified random sample[6] of 54 projects at six of the seven departments and collected supporting documentation for the responses given. However, we did not review a sample of projects at Defense because the department was unable to provide the requested information for 34 projects until April 2016, which was too late to be included in our report. We therefore could not verify its reported delivery rates for a sample of projects since our methodology required that we have information on all of a department's projects in order to perform a random sample. For the six departments that we did sample, we grouped each of the projects reported in the instruments into two categories, either "yes" if the project had reported the delivery of functionality in at least one time period or "no/not applicable" if the project did not report the delivery of functionality in at least one time period.

For each of the sampled projects, we obtained and analyzed project documentation, including project delivery schedules or other artifacts that identified delivered or planned-to-be-delivered functionality and department or bureau-level guidance that included a definition of useable functionality. In five instances for the sample of "yes" projects, the department reported that the status of delivered or planned functionality was incorrect and we updated the "yes" response in the data collection instrument to either a "no" or "not applicable," as appropriate. Due to these changes and the inability to sample projects at Defense, the percentage of useable functionality may be lower than reported. However, our other measures to ensure the reliability of the data reported by the departments ensure the data is sufficiently reliable for the purpose of this report.

To address our third objective, we analyzed the seven selected departments' policies and plans for implementing CIO certification of adequate incremental development to determine whether they were

[6]A stratified random sample is a sample design by first classifying the population into several strata (or subdivisions of a population) and then taking a random sample from each stratum.

consistent with provisions of the *Federal Information Technology Acquisition Reform Act* (FITARA) [7] that states that OMB is to require in its annual IT capital planning guidance that covered agency CIOs certify that IT investments are adequately implementing incremental development. To do so, we reviewed the guidance that OMB subsequently issued and the status of the selected departments' plans to implement the guidance. In addition, we interviewed staff from OMB's Office of E-Government and Information Technology regarding OMB guidance related to incremental development and FITARA.

We conducted this performance audit from April 2015 to August 2016, 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.

[7]40 U.S.C. § 11319(b)(1)(B)(ii). *Federal Information Technology Acquisition Reform* provisions of the *Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for Fiscal Year 2015,* Pub. L. No. 113-291, div. A, title VIII, subtitle D, 128 Stat. 3292, 3438-3450 (Dec. 19, 2014).

Appendix II: Federal Agency Major IT Investment Projects Reported Plans to Deliver Functionality on the IT Dashboard for Fiscal Year 2016

Table 5 lists the total number of federal department and agency software development projects primarily in development that reported plans to deliver functionality every 6 months for fiscal year 2016 on the IT Dashboard as of August 31, 2015.

Table 5: Federal Agency Software Development Project Plans to Deliver Functionality Every 6 Months for Fiscal Year 2016, as Reported on the IT Dashboard

Department/agency	Number of major investments	Number of projects associated with investments	Number of projects planning delivery of release every 6 months
U.S. Department of Agriculture	4	11	8
Department of Commerce	9	84	78
Department of Defense	36	51	4
Department of Education	12	14	11
Department of Energy	2	1	1
Department of Health and Human Services	18	48	42
Department of Homeland Security	13	23	13
Department of Housing and Urban Development	1	3	0
Department of the Interior	3	0	0
Department of Justice	1	1	0
Department Labor	3	5	3
Department of State	5	6	2
Department of Transportation	20	60	5
Department of the Treasury	12	28	18
Department of Veterans Affairs	10	95	95
Environmental Protection Agency	3	6	1
General Services Administration	4	5	5
National Archives and Records Administration	1	4	2
Office of Personnel Management	1	0	0
Small Business Administration	1	0	0
Social Security Administration	9	24	12

Department/agency	Number of major investments	Number of projects associated with investments	Number of projects planning delivery of release every 6 months
U.S. Agency for International Development	1	0	0
Total	**169**	**469**	**300**

Source: GAO analysis of IT Dashboard data. I GAO-16-469

Appendix III: Assessment of Selected Departments' Status of Incremental Development

For each of the seven departments in our review, the following sections provide a brief summary of the discretionary budget and IT investment information for fiscal years 2015 and 2016 and the status of incremental development for software development investments primarily in development for these fiscal years as reported to us by the departments. In some cases, the totals noted in the breakdown of IT spending may not add up to the total IT spending reported on the IT Dashboard due to rounding.

Department of Commerce

Figure 2 and table 6 highlight the status of incremental development at the Department of Commerce for software development investments primarily in development for fiscal years 2015 and 2016.

Figure 2: Department of Commerce Budget and Investment Information and Status of Major IT Software Development Projects Delivering Functionality for Fiscal Years 2015 and 2016

Department of Commerce (Commerce)

Budget and Investment Information

Fiscal year 2015

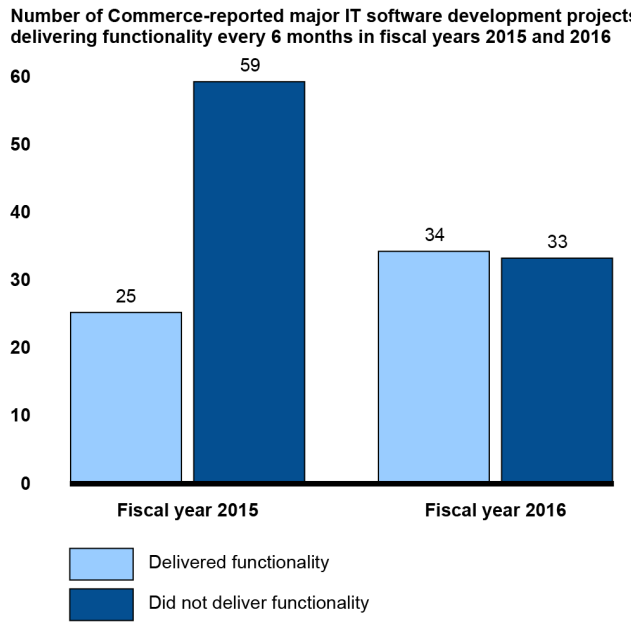
Budget request: $8.8 billion
Total IT spending reported on IT Dashboard: $2.2 billion
Breakdown of information technology (IT) spending:
- Major IT investments: $1.5 billion
- Non-major IT investments: $663 million
- Development: $756 million
- Operations and maintenance: $1.4 billion

Total number of IT investments: 136
- Major investments: 32
- Non-major investments: 104

Fiscal year 2016

Budget request: $9.8 billion
Total IT spending reported on IT Dashboard: $2.3 billion
Breakdown of IT spending:
- Major IT investments: $1.67 billion
- Non-major IT investments: $642 million
- Development: $852 million
- Operations and maintenance: $1.46 billion

Total number of IT investments: 128
- Major investments: 29
- Non-major investments: 99



Source: GAO analysis of federal IT Dashboard and department data. | GAO-16-469

Table 6: Status of Department of Commerce Major IT Software Development Investments' Delivery of Functionality in Fiscal Years 2015 and 2016, as Reported to GAO

	Fiscal year 2015				Fiscal year 2016			
Investment name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Census - 2020 Decennial Census Research and Testing, Operational Development, and Systems Testing, Fiscal Year 2015 – Fiscal Year 2018	$74.13	17	6	9	$199.29	17	11	11
Census - Census Enterprise Data Collection and Processing	$66.17	11	9	10	$77.62	11	11	11
Commerce Business Application Solutions	$40.93	1	0	0	$44.09	1	0	0
Commerce Enterprise Security Operations Center	$5.02	1	1	1	$5.18	1	1	1
National Oceanic and Atmospheric Administration/National Weather Service/ Integrated Dissemination Program	$44.77	3	3	3	$0	3	3	3
United States Patent and Trademark Office Fee Processing Next Generation	$17.86	13	0	2	$11.98	10	6	7
United States Patent and Trademark Office Patent End-to-End 2	$116.82	14	1	12	$117.31	15	2	14
United States Patent and Trademark Office Patent Trial and Appeal Board End to End	$12.68	2	1	2	$11.46	1	0	1
United States Patent and Trademark Office Patents End-to-End: Software Engineering	$13.70	10	1	6	$0	0	0	0

Investment name	Fiscal year 2015 Spending (millions)	Fiscal year 2015 Number of projects	Fiscal year 2015 Number delivering functionality every 6 months	Fiscal year 2015 Number delivering functionality in fiscal year	Fiscal year 2016 Spending (millions)	Fiscal year 2016 Number of projects	Fiscal year 2016 Number delivering functionality every 6 months	Fiscal year 2016 Number delivering functionality in fiscal year
United States Patent and Trademark Office Trademark Next Generation External	$11.28	6	2	5	$4.62	3	0	3
United States Patent and Trademark Office Trademark Next Generation 2	$29.84	6	1	6	$21.17	5	0	5
Total	**$433.20**	**84**	**25**	**56**	**$492.72**	**67**	**34**	**56**

Sources: GAO analysis of IT Dashboard and department data. | GAO-16-469

Note: Department budget and investment spending information for fiscal years 2015 and 2016 was obtained from the IT Dashboard on August 31, 2015, and February 29, 2016, respectively. The department provided updated project information in March 2016. Fiscal year 2016 represents department-reported planned spending as we are currently in the fiscal year.

Department of Defense

Figure 3 and table 7 highlight the status of incremental development at the Department of Defense for software development investments primarily in development for fiscal years 2015 and 2016 as reported to us.

Figure 3: Department of Defense Budget and Investment Information and Status of Major IT Software Development Projects Delivering Functionality for Fiscal Years 2015 and 2016

Department of Defense (Defense)

Budget and Investment Information

Fiscal year 2015

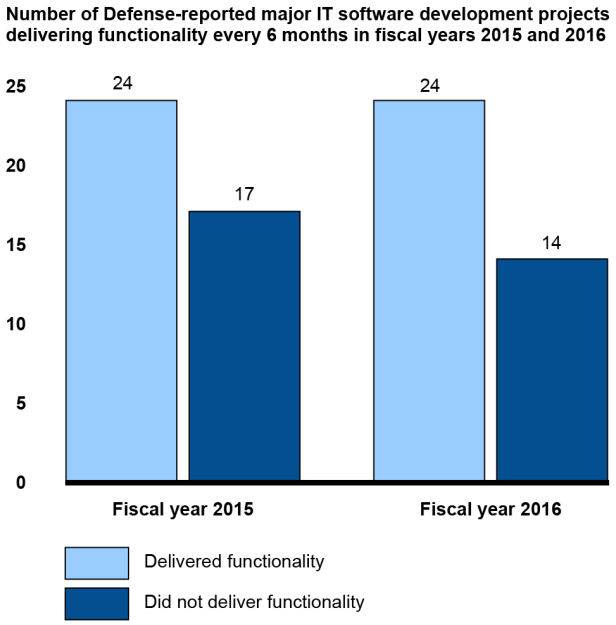
Budget request: $495.6 billion
Total IT spending reported on IT Dashboard: $30.0 billion
Breakdown of information technology (IT) spending:
- Major IT investments: $13.8 billion
- Non-major IT investments: $16.2 billion
- Development: $6.9 billion
- Operations and maintenance: $23.1 billion

Total number of IT investments: 2,966
- Major investments: 124
- Non-major investments: 2,842

Fiscal year 2016

Budget request: $585.2 billion
Total IT spending reported on IT Dashboard: $30.8 billion
Breakdown of IT spending:
- Major IT investments: $13.6 billion
- Non-major IT investments: $17.2 billion
- Development: $7.5 billion
- Operations and maintenance: $23.3 billion

Total number of IT investments: 3,158
- Major investments: 127
- Non-major investments: 3,031



Source: GAO analysis of federal IT Dashboard and department data. | GAO-16-469

Table 7: Status of Department of Defense Major IT Software Development Investments' Delivery of Functionality for Fiscal Years 2015 and 2016, as Reported to GAO

	Fiscal year 2015				Fiscal year 2016			
Investment Name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Advanced Field Artillery Tactical Data System	$40.14	2	1	2	$30.20	1	0	0
Air Force Integrated Personnel and Pay System	$68.64	1	0	0	$45.20	1	0	0
Aviation Tactical Communication Systems	$53.11	1	0	1	$29.87	1	0	0
Common Aviation Command and Control System Increment 1	$53.88	1	1	1	$51.45	1	1	1
Consolidated Afloat Network Enterprise Services	$395.45	1	1	1	$364.37	1	1	1
Defense Agencies Initiative Increment 2	$72.28	2	1	2	$69.62	2	0	0
Defense Enterprise Accounting and Management System- Increment 1	$128.46	1	0	1	$171.11	1	1	1
Distributed Common Ground System – Army Increment 1	$212.48	1	0	1	$0.00	1	0	1
Global Broadcast Service	$60.94	1	0	0	$30.78	1	1	1
Installation Information Infrastructure Modernization Program	$71.33	1	1	1	$69.22	1	1	1
Integrated Electronic Health Record Increment 1	$94.86	2	1	2	$18.30	2	0	1
Integrated Personnel and Pay System- Army Increment 2	$85.40	1	1	1	$140.46	1	0	0
Joint Battle Command-Platform	$92.32	2	2	2	$136.07	2	2	2
Joint Space Operations Center Mission System Increment 1	$.16	1	0	0	$0.00	1	0	0

	Fiscal year 2015				Fiscal year 2016			
Investment Name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Joint Space Operations Center Mission System Increment 2	$73.93	1	0	0	$69.29	1	1	1
Logistics Modernization Program Increment 2	$125.56	1	0	1	$93.81	1	1	1
Multifunctional Information Distribution System	$94.49	5	5	5	$106.60	5	5	5
Next Generation Operational Control System	$238.40	1	0	1	$294.24	1	0	1
Tactical Mission Command	$141.16	1	0	0	$141.73	1	0	1
Theater Battle Management Core System	$41.11	3	0	2	$28.43	2	0	2
Theater Medical Information Program Joint Increment 2	$86.66	6	6	6	$62.17	6	6	6
Warfighter Information Network Tactical Increment 1	$349.85	1	1	1	$221.22	1	1	1
Warfighter Information Network Tactical Increment 2	$421.26	3	2	3	$501.21	2	2	2
Warfighter Information Network Tactical Increment 3	$113.16	1	1	1	$39.70	1	1	1
Total	**$3.12 billion**	**41**	**24**	**35**	**$2.72 billion**	**38**	**24**	**30**

Sources: GAO analysis of IT Dashboard and department data. | GAO-16-469

Note: Department budget and investment spending information for fiscal years 2015 and 2016 was obtained from the IT Dashboard on August 31, 2015, and February 29, 2016, respectively. The department provided updated project information in April 2016. Fiscal year 2016 represents department-reported planned spending as we are currently in the fiscal year.

Department of Education

Figure 4 and table 8 highlight the status of incremental development at the Department of Education for software development investments primarily in development for fiscal years 2015 and 2016 as reported to us.

Figure 4: Department of Education Budget and Investment Information and Status of Major IT Software Development Projects Delivering Functionality for Fiscal Years 2015 and 2016

Department of Education (Education)

Budget and Investment Information

Fiscal year 2015

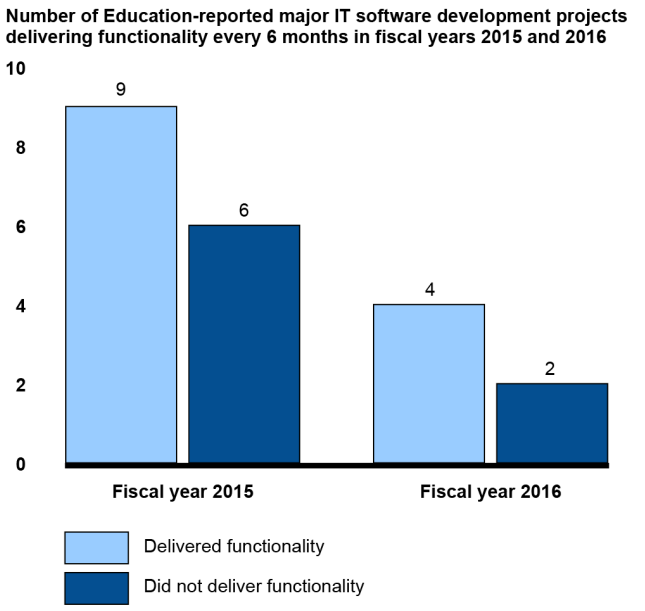
Budget request: $68.6 billion
Total IT spending reported on IT Dashboard: $683.1 million
Breakdown of information technology (IT) spending:
- Major IT investments: $598.2 million
- Non-major IT investments: $82.8 million
- Development: $146.4 million
- Operations and maintenance: $534.6 million

Total number of IT investments: 161
- Major investments: 40
- Non-major investments: 121

Fiscal year 2016

Budget request: $70.7 billion
Total IT spending reported on IT Dashboard: $688.5 million
Breakdown of IT spending:
- Major IT investments: $600.5 million
- Non-major IT investments: $84.5 million
- Development: $139.5 million
- Operations and maintenance: $545.6 million

Total number of IT investments: 161
- Major investments: 42
- Non-major investments: 119



Source: GAO analysis of federal IT Dashboard and department data. | GAO-16-469

Table 8: Status of Department of Education Major IT Software Development Investments' Delivery of Functionality for Fiscal Years 2015 and 2016, as Reported to GAO

	Fiscal year 2015				Fiscal year 2016			
Investment name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Contracts and Purchasing Support System	$4.35	4	0	4	$3.58	3	3	3
Educational Assessment	$13.64	2	2	2	$23.68	0	0	0
Enterprise Trusted Internet Connection	$1.45	2	2	2	$1.77	1	0	1
Institute of Educational Sciences Knowledge Utilization	$10.48	5	3	4	$14.93	1	1	1
Integrated Student Experience	$2.25	3	2	2	$2.64	1	0	1
National Center for Education Statistics Administrative Data	$8.73	3	0	0	$4.57	0	0	0
Total	**$40.90**	**19**	**9**	**14**	**$51.17**	**6**	**4**	**6**

Sources: GAO analysis of IT Dashboard and department data. | GAO-16-469

Note: Department budget and investment spending information for fiscal years 2015 and 2016 was obtained from the IT Dashboard on August 31, 2015, and February 29, 2016, respectively. The department provided updated project information in March 2016. Fiscal year 2016 represents department-reported planned spending as we are currently in the fiscal year.

Department of Health and Human Services

Figure 5 and table 9 highlight the status of incremental development at the Department of Health and Human Services for software development investments primarily in development for fiscal years 2015 and 2016 as reported to us.

Figure 5: Department of Health and Human Services Budget and Investment Information and Status of Major IT Software Development Projects Delivering Functionality for Fiscal Years 2015 and 2016

Department of Health and Human Services (HHS)

Budget and Investment Information

Fiscal year 2015

Budget request: $77.1 billion
Total IT spending reported on IT Dashboard: $12.6 billion
Breakdown of information technology (IT) spending:
- Major IT investments: $3.5 billion
- Non-major IT investments: $9.1 billion
- Development: $3.6 billion
- Operations and maintenance: $9.0 billion

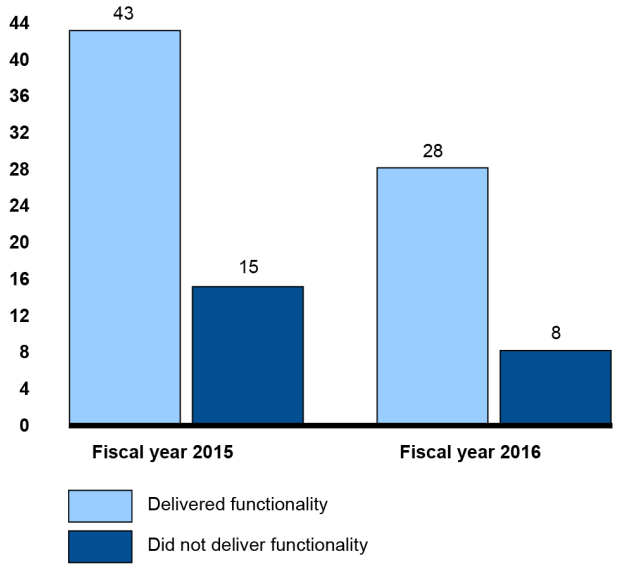
Total number of IT investments: 577
- Major investments: 94
- Non-major investments: 483

Fiscal year 2016

Budget request: $83.8 billion
Total IT spending reported on IT dashboard: $12.6 billion
Breakdown of IT spending:
- Major IT investments: $3.4 billion
- Non-major IT investments: $9.0 billion
- Development: $3.7 billion
- Operations and maintenance: $8.7 billion

Total number of IT investments: 595
- Major investments: 110
- Non-major investments: 485

Number of HHS-reported major IT software development projects delivering functionality every 6 months in fiscal years 2015 and 2016



Source: GAO analysis of federal IT Dashboard and department data. | GAO-16-469

Table 9: Status of Department of Health and Human Services Major IT Software Development Investments' Delivery of Functionality for Fiscal Years 2015 and 2016, as Reported to GAO

	Fiscal year 2015				Fiscal year 2016			
Investment name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Centers for Disease Control and Prevention National Select Agent Platform	$ 5.70	1	0[a]	1	$3.21	0	0	0
Centers for Medicare and Medicaid Services Accountable Care Organizations	$ 22.35	1	1	1	$20.58	1	1	1
Centers for Medicare and Medicaid Services Federally Facilitated Marketplace	$ 373.51	3	3	3	$365.24	2	2	2
Centers for Medicare and Medicaid Services Fraud Prevention System	$ 27.80	1	1	1	$25.42	1	0[a]	1
Centers for Medicare and Medicaid Services Healthcare Quality End Stage Renal Disease Systems	$ 40.43	2	2	2	$0.00	2	2	2
Centers for Medicare and Medicaid Services International Classification of Diseases-10 Initiative	$ 20.29	1	1	1	$18.21	1	0	1
Centers for Medicare and Medicaid Services Medicaid & Children's Health Insurance Program Business Information and Solutions	$ 12.04	2	2	2	$46.34	2	2	2

	Fiscal year 2015				Fiscal year 2016			
Investment name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Centers for Medicare and Medicaid Services Master Data Management	$16.74	1	1	1	$15.60	1	1	1
Centers for Medicare and Medicaid Services Medicare-Medicaid Financial Alignment	$ 13.12	3	2[a]	3	$13.82	2	2	2
Centers for Medicare and Medicaid Services Physician Feedback Program	$ 14.18	1	1	1	$10.16	0	0	0
Federal Health Architecture	$ 3.52	1	1	1	$1.20	1	1	1
Food and Drug Administration Center for Drug Evaluation and Research Integrated Data Management	$ 19.50	3	2	2	$20.55	3	3	3
Food and Drug Administration Office of Regulatory Affairs Automated Laboratory Management	$ 15.40	8	8	8	$14.52	5	4	5
Food and Drug Administration Office of Regulatory Affairs Mission Accomplishments and Regulatory Compliance Services	$ 23.92	13	2	12	$22.36	8	4	8
Food and Drug Administration Office of Regulatory Affairs Regulatory Business Information Services	$ 13.60	4	4	4	$14.33	4	4	4
Health and Human Services Unified Financial Management System Investment	$ 71.26	2	2	2	$20.01	2	2	2

Investment name	Fiscal year 2015 Spending (millions)	Fiscal year 2015 Number of projects	Fiscal year 2015 Number delivering functionality every 6 months	Fiscal year 2015 Number delivering functionality in fiscal year	Fiscal year 2016 Spending (millions)	Fiscal year 2016 Number of projects	Fiscal year 2016 Number delivering functionality every 6 months	Fiscal year 2016 Number delivering functionality in fiscal year
Health Resources and Services Administration - Bureau of Primary Health Care Management Information System	$ 24.50	10	10	10	$26.20	0	0	0
Office of the Secretary Office of Medicare Hearings and Appeals Electronic Case Adjudication Processing Environment (Investment)	$ 8.48	1	0	0	$15.09	1	0	1
Total	**$ 726.34**	**58**	**43**	**55**	**$652.84**	**36**	**28**	**36**

Sources: GAO analysis of IT Dashboard and department data. | GAO-16-469

[a]Project(s) within this investment were completed during the fiscal year and were therefore not counted as delivering every 6 months in both applicable time periods.

Note: Department budget and investment spending information for fiscal years 2015 and 2016 was obtained from the IT Dashboard on August 31, 2015, and February 29, 2016, respectively. Fiscal year 2016 represents department-reported planned spending as we are currently in the fiscal year.

Department of Homeland Security

Figure 6 and table 10 highlight the status of incremental development at the Department of Homeland Security for software development investments primarily in development for fiscal years 2015 and 2016 as reported to us.

Figure 6: Department of Homeland Security Budget and Investment Information and Status of Major IT Software Development Projects Delivering Functionality for Fiscal Years 2015 and 2016

Department of Homeland Security (DHS)

Budget and Investment Information

Fiscal year 2015

Budget request: $38.2 billion

Total IT spending reported on IT Dashboard: $5.9 billion

Breakdown of information technology (IT) spending:

- Major IT investments: $4.8 billion
- Non-major IT investments: $1.1 billion
- Development: $905 million
- Operations and maintenance: $4.9 billion

Total number of IT investments: 347

- Major investments: 89
- Non-major investments: 258

Fiscal year 2016

Budget request: $ 41.2 billion

Total IT spending reported on IT Dashboard: $6.2 billion

Breakdown of IT spending:

- Major IT investments: $5.1 billion
- Non-major IT investments: $1.0 billion
- Development: $1.1 billion
- Operations and maintenance: $5.0 billion

Total number of IT investments: 336

- Major investments: 92
- Non-major investments: 244

Source: GAO analysis of federal IT Dashboard and department data. | GAO-16-469

Number of DHS-reported major IT software development projects delivering functionality every 6 months in fiscal years 2015 and 2016

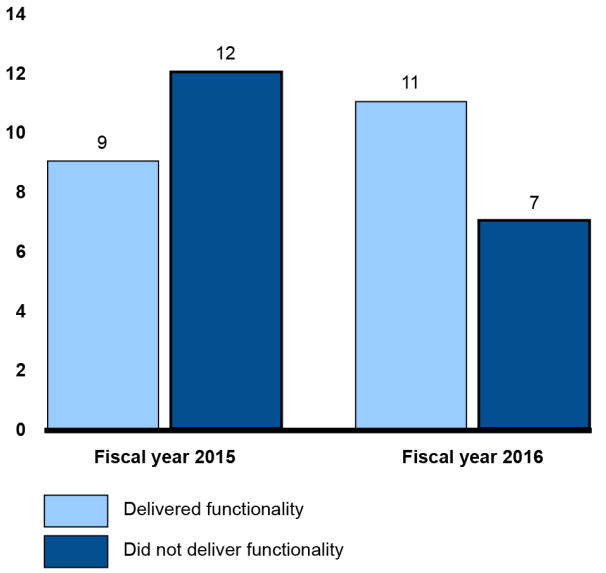


Table 10: Status of Department of Homeland Security Major IT Software Development Investments' Delivery of Functionality for Fiscal Years 2015 and 2016, as Reported to GAO

	Fiscal year 2015				Fiscal year 2016			
Investment name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Federal Emergency Management Agency - Non-Disaster Grants	$8.50	3	0	1	$8.51	4	0	4
Transportation Security Administration – Security Technology Integrated Program	$14.25	5	5	5	$14.58	5	5	5
Transportation Security Administration - Technology Infrastructure Modernization Program	$42.71	3	1	1	$41.94[a]	3	1	1
United States Coast Guard - Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance	$36.30	3	0	2	$36.60	1	1	1
United States Citizenship and Immigration Services – Transformation	$177.27	5	1	2	$175.78	3	2	3
United States Secret Service - Information Integration and Technology Transformation	$45.59	2	2	2	$46.29	2	2	3
Total	**$324.62**	**21**	**9**	**13**	**$323.70**	**18**	**11**	**16**

Sources: GAO analysis of IT Dashboard and department data. | GAO-16-469

[a]The Technology Infrastructure Modernization Program's fiscal year 2016 spending amount reflects the amount included in DHS's budget justification.

Note: Department budget and investment spending information for fiscal years 2015 and 2016 was obtained from the IT Dashboard on August 31, 2015, and February 29, 2016, respectively. The department provided updated project information in March 2016. Fiscal year 2016 represents department-reported planned spending as we are currently in the fiscal year. In addition, the Transportation Security Administration's Technology Infrastructure Modernization Program is a single IT development effort divided into 3 sequential projects, and delivery on the second and third projects cannot begin until the first project is complete. While each of the project delivery time frames were staggered so delivery of functionality occurred for the investment every 3 months, the projects could not be counted as delivering every 6 months since there was only one deliverable.

Department of Transportation

Figure 7 and table 11 highlight the status of incremental development at the Department of Transportation for software development investments primarily in development for fiscal years 2015 and 2016 as reported to us.

Figure 7: Department of Transportation Budget and Investment Information and Status of Major IT Software Development Projects Delivering Functionality for Fiscal Years 2015 and 2016

Department of Transportation (Transportation)

Budget and Investment Information

Fiscal year 2015

Budget request: $91 billion
Total IT spending reported on IT Dashboard: $3.1 billion
Breakdown of information technology (IT) spending:
- Major IT investments: $2.1 billion
- Non-major IT investments: $974.9 million
- Development: $1.6 billion
- Operations and maintenance: $1.5 billion

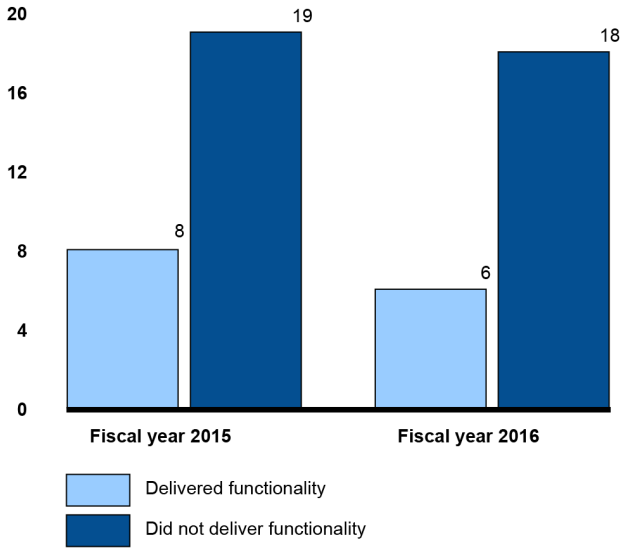
Total number of IT investments: 355
- Major investments: 34
- Non-major investments: 321

Fiscal year 2016

Budget request: $94.7 billion
Total IT spending reported on IT Dashboard: $3.5 billion
Breakdown of IT spending:
- Major IT investments: $2.2 billion
- Non-major IT investments: $1.3 billion
- Development: $1.8 billion
- Operations and maintenance: $1.7 billion

Total number of IT investments: 360
- Major investments: 33
- Non-major investments: 327

Number of Transportation-reported major IT software development projects delivering functionality every 6 months in fiscal years 2015 and 2016



Source: GAO analysis of federal IT Dashboard and department data. | GAO-16-469

Table 11: Status of Department of Transportation Major IT Software Development Investments' Delivery of Functionality for Fiscal Years 2015 and 2016, as Reported to GAO

	Fiscal year 2015				Fiscal year 2016			
Investment Name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Federal Aviation AdministrationXX102: Terminal Flight Data Manager	$41.08	1	0	0	$16.48	1	0	0
Federal Aviation AdministrationXX115: Terminal Automation Modernization and Replacement Program	$350.65	3	1	3	$445.85	3	2	2
Federal Aviation AdministrationXX169: Wide Area Augmentation System	$120.54	2	0	0	$129.81	2	0	2
Federal Aviation AdministrationXX505: En Route Automation Modernization System Enhancements and Tech Refresh	$46.93	1	1	1	$81.50	1	0	1
Federal Aviation AdministrationXX610: Aviation Safety Knowledge Management	$14.91	2	0	0	$12.67	2	0	1
Federal Aviation AdministrationXX612: System Approach for Safety Oversight	$37.86	1	1	1	$30.22	1	1	1
Federal Aviation AdministrationXX703: System Wide Information Management	$40.79	3	1	3	$35.17	3	1	1

	Fiscal year 2015				Fiscal year 2016			
Investment Name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Federal Aviation AdministrationXX704: Automatic Dependent Surveillance-Broadcast	$264.16	6	4	6	$202.12	3	2	2
Federal Aviation AdministrationXX711: Data Communications Next Generation Support	$152.88	2	0	1	$237.75	2	0	1
Federal Aviation AdministrationXX713: Next Generation National Airspace System Voice System	$25.30	1	0	0	$58.90	1	0	0
Federal Highway AdministrationX031: Fiscal Management Information System 5.0	$4.05	1	0	0	$1.92	1	0	1
Federal Motor Carrier Safety Administration100: Unified Registration System	$3.19	4	0	0	$3.83	4	0	2
Total	**$1.10 billion**	**27**	**8**	**15**	**$1.25 billion**	**24**	**6**	**14**

Sources: GAO analysis of IT Dashboard and department data. | GAO-16-469

Note: Department budget and investment spending information for fiscal years 2015 and 2016 was obtained from the IT Dashboard on August 31, 2015, and February 29, 2016, respectively. The department provided updated project information in March 2016. Fiscal year 2016 represents department-reported planned spending as we are currently in the fiscal year.

Department of the Treasury

Figure 8 and table 12 highlight the status of incremental development at the Department of the Treasury for software development investments primarily in development for fiscal years 2015 and 2016 as reported to us.

Figure 8: Department of the Treasury Budget and Investment Information and Status of Major IT Software Development Projects Delivering Functionality for Fiscal Years 2015 and 2016

Department of the Treasury (Treasury)

Budget and Investment Information

Fiscal year 2015

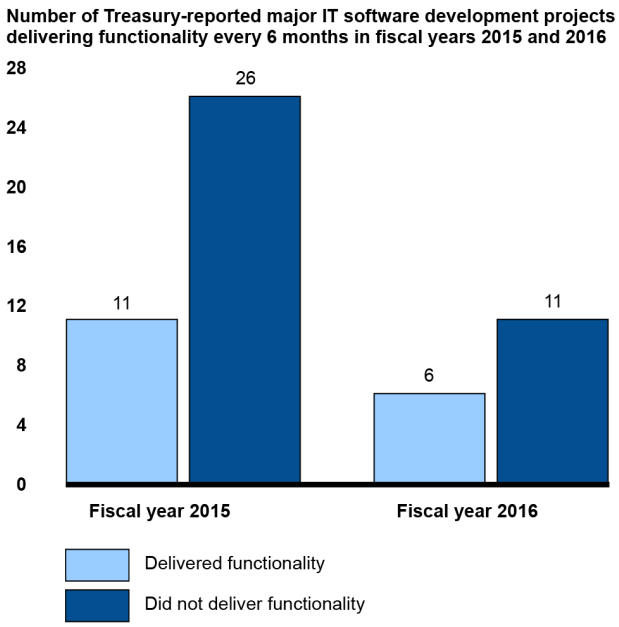
Budget request: $13.8 billion
Total IT spending reported on IT Dashboard: $3.8 billion
Breakdown of information technology (IT) spending:
- Major IT investments: $2.9 billion
- Non-major IT investments: $896 million
- Development: $893.3 million
- Operations and maintenance: $2.9 billion

Total number of IT investments: 281
- Major investments: 60
- Non-major investments: 221

Fiscal year 2016

Budget request: $14.3 billion
Total IT spending reported on IT Dashboard: $ 3.9 billion
Breakdown of IT spending:
- Major IT investments: $3.0 billion
- Non-major IT investments: $947.9 million
- Development: $910.4 million
- Operations and maintenance: $3.03 billion

Total number of IT investments: 314
- Major investments: 59
- Non-major investments: 255



Source: GAO analysis of federal IT Dashboard and department data. | GAO-16-469

Table 12: Status of Department of the Treasury Major IT Software Development Investments' Delivery of Functionality for Fiscal Years 2015 and 2016, as Reported to GAO

	Fiscal year 2015				Fiscal year 2016			
Investment name	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year	Spending (millions)	Number of projects	Number delivering functionality every 6 months	Number delivering functionality in fiscal year
Affordable Care Act Administration	$373.00	6	2	5	$303.20	3	0[a]	3
Customer Account Data Engine 2	$130.93	3	0	3	$135.34	0	0	0
FedDebt	$21.39	4	3	4	$32.11	0	0	0
Foreign Account Tax Compliance Act	$62.61	7	0	5	$89.09	7	0	1
Over the Counter Channel Application	$21.70	3	0	3	$21.11	0	0	0
Payment Application Modernization	$ 8.53	3	1	3	$0.00	0	0	0
Post Payment System	$15.74	4	0	4	$0.00	0	0	0
Return Review Program (Previously Implement Return Review Program - Replaces Electronic Fraud Detection System)	$63.60	2	1	1	$91.90	2	1	1
Treasury Enterprise Identity, Credential and Access Management	$54.90	5	4	5	$20.88	5	5	5
Total	**$752.40**	**37**	**11**	**33**	**$693.63**	**17**	**6**	**10**

Sources: GAO analysis of IT Dashboard and department data. | GAO-16-469

[a]Project(s) within this investment were completed during the fiscal year and were therefore not counted as delivering every 6 months in both applicable time periods.

Note: Department budget and investment spending information for fiscal years 2015 and 2016 was obtained from the IT Dashboard on August 31, 2015, and February 29, 2016, respectively. Fiscal year 2016 represents department-reported planned spending as we are currently in the fiscal year.

Appendix IV: Comments from the Department of Commerce

THE DEPUTY SECRETARY OF COMMERCE
Washington, D.C. 20230

June 10, 2016

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

Dear Mr. Powner:

Thank you for the opportunity to review and comment on the Government Accountability Office's draft report titled *Information Technology Reform: Agencies Need to Increase Their Use of Incremental Development Practices* (GAO-16-469).

On behalf of the Department of Commerce, I have enclosed our comments on the draft report. We concur with the recommendations set forth in the draft report and will incorporate these recommendations into our CIO dashboard reporting. To address GAO's recommendations, the Department has issued updated guidance in the Department's Capital Planning and Investment Control Handbook on the use, definition, and certification of incremental development in accordance with the guidance issued by the Office of Management and Budget on the implementation of the Federal Information Technology Reform Act. The Department will continue to monitor the quality of major investment reporting on incremental development and will work with the bureaus to provide better training to remedy any reporting issues.

If you have any questions, please contact Steve Cooper, the Department's Chief Information Officer, at (202) 482-4797.

Sincerely,

Bruce H. Andrews

Enclosure

Department of Commerce
Office of the Chief Information Officer
Office of the Secretary

Technical and Editorial Comments on the Draft GAO Report Titled *Information Technology Reform: Agencies Need to Increase Their Use of Incremental Development Practices* (GAO-16-469)

The Office of the Chief Information Officer has reviewed the draft report and our technical and editorial comments are below. Page numbers refer to page numbers in the report unless otherwise stated.

General Comments

We concur with the report's findings and recommendations.

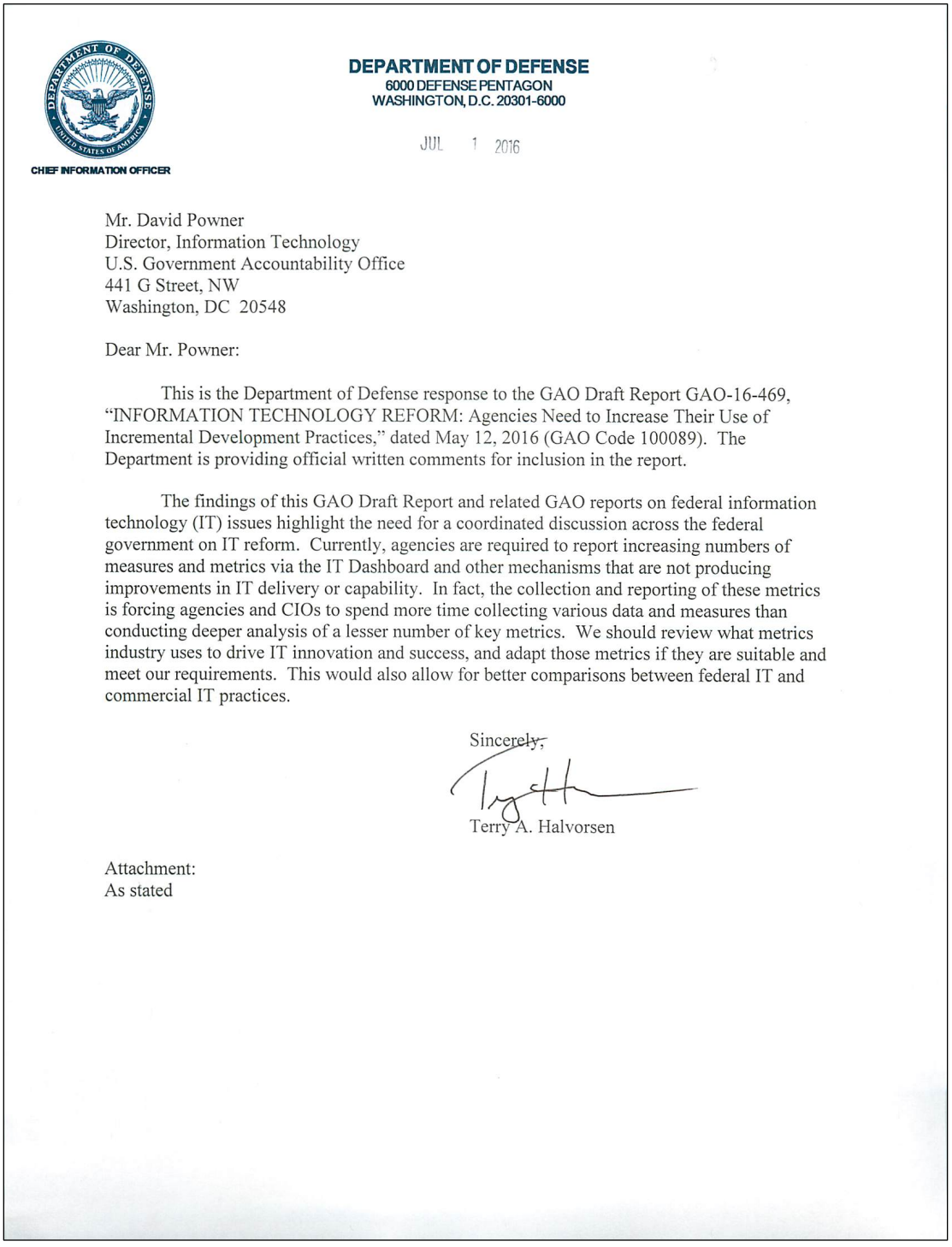
Recommended Changes for Factual/Technical Information.

None.

Editorial Comments

Commerce has updated the Department's Capital Planning and Investment Control Handbook formally defining incremental development, describing when incremental development is to be used, and describing a process for certifying when an incremental development activity is accomplished.

Appendix V: Comments from the Department of Defense



DEPARTMENT OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-6000

CHIEF INFORMATION OFFICER

JUL 1 2016

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

Dear Mr. Powner:

This is the Department of Defense response to the GAO Draft Report GAO-16-469, "INFORMATION TECHNOLOGY REFORM: Agencies Need to Increase Their Use of Incremental Development Practices," dated May 12, 2016 (GAO Code 100089). The Department is providing official written comments for inclusion in the report.

The findings of this GAO Draft Report and related GAO reports on federal information technology (IT) issues highlight the need for a coordinated discussion across the federal government on IT reform. Currently, agencies are required to report increasing numbers of measures and metrics via the IT Dashboard and other mechanisms that are not producing improvements in IT delivery or capability. In fact, the collection and reporting of these metrics is forcing agencies and CIOs to spend more time collecting various data and measures than conducting deeper analysis of a lesser number of key metrics. We should review what metrics industry uses to drive IT innovation and success, and adapt those metrics if they are suitable and meet our requirements. This would also allow for better comparisons between federal IT and commercial IT practices.

Sincerely,

Terry A. Halvorsen

Attachment:
As stated

GAO DRAFT REPORT DATED MAY 12, 2016
GAO-16-469 (GAO CODE 100089)

"INFORMATION TECHNOLOGY REFORM: AGENCIES NEED TO INCREASE THEIR USE OF INCREMENTAL DEVELOPMENT PRACTICES"

DEPARTMENT OF DEFENSE COMMENTS TO THE GAO RECOMMENDATION

RECOMMENDATION 1: To improve the quality of the seven departments' information on project incremental delivery reported to the Information Technology (IT) Dashboard, the Government Accountability Office (GAO) recommend that the Secretary of Defense direct its Chief Information Officer (CIO) to review major IT investment project data reported on the IT Dashboard and update the information as appropriate in the following areas: (1) whether the project is in-progress or complete; (2) whether the project is a software development project or not; and (3) the status of the delivery of functionality every 6 months, ensuring that these data are consistent across all reporting channels.

DoD RESPONSE: Partially Concur. DoD is taking action to update the IT Dashboard data as appropriate. However, DoD considers other factors and integrates information from other key DoD stakeholders in rating investments listed on the IT Dashboard. The rating process includes assessing whether each major investment is using an appropriate development strategy, but does not require that each investment be developed incrementally and provide capability every 6 months.

RECOMMENDATION 2: To improve the certification of adequate incremental development, the GAO recommend that the Secretary of Defense direct its CIO to establish a Department policy and process for the certification of major IT investments' adequate use of incremental development, in accordance with the Office of Management and Budget (OMB) guidance on the implementation of Federal Information Technology Acquisition Reform Act (FITARA). The success of an IT investment is not exclusively attributable to whether or not the investment is incrementally developed.

DoD RESPONSE: Non-Concur. The Department's existing acquisition system includes policy and processes explicitly defined in DoD Directive 5000.01 and DoD Instruction 5000.02 regarding the use of incremental development for DoD systems. This methodology is documented in DoD's approved FITARA Implementation Plan.

DoD Non-Concurs with the following statements in the draft GAO Report for #100089:

- GAO Page 21-22 Statement: "Defense did not provide the requested information in time to be included in our review, and so we could not verify the Department's reported delivery rates for a sample of projects."

DoD Comment: Change the above statement to read, "Defense did not provide all of the requested information in time to be included in our review, and so we could not verify the Department's reported delivery rates for some of the projects."

Rationale: The revised language more accurately states the facts that most of the data was delivered on time and that the late delivery of the remaining data impacted GAO's analysis. As written, readers may infer that DoD did not deliver any of the requested data.

- GAO Page 27 Statement: "The [Defense] Department did not intend to institute a separate process for the CIO to certify incremental investments since the majority of their investments would not be appropriate for incremental development."

  DoD Comment: Change the above statement to read, "The [Defense] Department did not intend to institute a separate process for the CIO to certify incremental investments since the Department's existing processes, documented in DoD's approved FITARA Implementation Plan, meet the intent to ensure that investments are appropriately implementing incremental strategies."

  Rationale: A separate CIO process is unnecessary and not cost effective. DoD's existing mechanism to use existing processes to accomplish the certification and reporting to OMB accomplishes the requirement and is consistent with the Department's OMB-approved FITARA Implementation Plan.

Appendix VI: Comments from the Department of Education

UNITED STATES DEPARTMENT OF EDUCATION

OFFICE OF THE CHIEF INFORMATION OFFICER

June 9, 2016 THE CHIEF INFORMATION OFFICER

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

Dear Mr. Powner:

I am writing to respond to recommendations made in the Government Accountability Office (GAO) draft report entitled "Information Technology Reform: Agencies Need to Increase Their Use of Incremental Development Practices (GAO-16-469)." The U.S. Department of Education (Department) appreciates the opportunity to respond to the GAO report. Below is our response to GAO's specific recommendations:

Recommendation 1: Review major IT investment project data reported on the IT Dashboard and update the information as appropriate in the following areas: (1) whether the project is in-progress or complete; (2) whether the project is a software development project or not; and (3) the status of the delivery of functionality every 6 months, ensuring that these data are consistent across all reporting channels.

Response: The Department concurs with GAO's recommendation and will direct project managers to provide information indicating if a project is complete or in progress; if it is a software development project or not; and the status of delivering functionality every 6 months. We will ensure that this information is kept current using our documented IT portfolio management process.

Recommendation 2: Establish a department policy and process for the certification of major IT investments' adequate use of incremental development, in accordance with OMB's guidance on the implementation of the (Federal Information Technology Acquisition Reform Act) FITARA.

Response: The Department concurs with GAO's recommendation. We will develop and implement a Department policy and a CIO certification process for adequate use of incremental development by September of 2016 as a part of our ongoing FITARA implementation.

Again, I appreciate the opportunity to respond to the GAO report. If you or your staff members have any questions regarding our response, please contact me at (202) 245-6252 or e-mail (Jason.Gray@ed.gov).

Sincerely,

Jason Gray
Chief Information Officer

400 MARYLAND AVE. S.W., WASHINGTON, DC 20202
www.ed.gov

The Department of Education's mission is to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access.

Appendix VII: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

June 9, 2016

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

Re: Draft Report GAO-16-469, "INFORMATION TECHNOLOGY REFORM: Agencies Need to Increase Their Use of Incremental Development Practices"

Dear Mr. Powner:

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO's) work in planning and conducting its review and issuing this report.

Department leadership is pleased with GAO's recognition that DHS has implemented Office of Management and Budget guidance requiring the adoption of an incremental software development methodology and iterative delivery of useable functionality across its portfolio of Information Technology (IT) investments, programs, and projects. The Department's recently published Agile Development instruction establishes Agile as the preferred development approach/methodology for all IT programs and projects, where appropriate.

To support the Agile Instruction and actual implementation of Agile, the DHS Agile Center of Excellence (COE) was created. The DHS Agile COE provides DHS Program and Project Managers with guidance and resources to successfully support the implementation of Agile IT development as outlined by the Agile Instruction and its implementing guidance, the DHS Agile Guidebook (currently in its final stages of pre-publication review). The DHS Agile COE also provides tools, templates, training resources, best practices, guides, and an Agile forum to educate and help Project Managers execute the Agile methodology and build upon best practices and experience from industry, federal government, and recent DHS Agile projects.

The Department is committed to Agile Development (which is not one specific methodology, but is a conceptual framework implemented through various agile methods) to promote delivering working, tested, deployable IT solutions on an

incremental basis to increase value, visibility, and adaptability, and to reduce program/project risk.

The draft report contained one recommendation for DHS, with which the Department concurs. Please see the attached for our detailed response to the recommendation.

Again, thank you for the opportunity to review and comment on the draft report. Technical comments were previously provided under separate cover. Please feel free to contact me if you have any questions. We look forward to working with you in the future.

Sincerely,

JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

2

Attachment: DHS Management Response to Recommendations Contained in GAO-16-469

GAO recommended that the Secretary of Homeland Security direct the DHS Chief Information Officer (CIO) to:

Recommendation 1: Review major IT investment project data reported on the IT Dashboard and update the information as appropriate in the following areas: (1) whether the project is in-progress or complete; (2) whether the project is a software development project or not; and (3) the status of the delivery of functionality every 6 months, ensuring that these data are consistent across all reporting channels.

Response: Concur. The Department surveyed its major IT investments to determine their level of adoption of incremental techniques, and found these successes were not all entered into the program of record by the various program officials. The Enterprise Business Management Office of the DHS Office of the Chief Information Officer will validate each investment reported on the IT Dashboard and work with program officials to ensure they appropriately update the program data which feeds the IT Dashboard. Estimated Completion Date: September 30, 2016.

3

Appendix VIII: GAO Contact and Staff Acknowledgments

GAO Contact

David A. Powner, (202) 512-9286 or pownerd@gao.gov

Staff Acknowledgments

In addition to the individual named above, the following staff made key contributions to this report: Dave Hinchman (Assistant Director), Valerie Hopkins (Analyst in Charge), Gerard Aflague, Jim Ashley (Assistant Director), Chris Businsky, Neil Doherty, Mary Evans, Nancy Glover, Angel Ip, Stuart Kaufman, Lori Martinez, Carl Ramirez (Assistant Director), Bradley Roach, and Andrew Stavisky.