



Report to the Committee on
Transportation and Infrastructure, House
of Representatives

December 2019

FEDERAL BUILDINGS

GSA Can Improve Its Communication about and Assessment of Major Construction Projects

Accessible Version

GAO Highlights

Highlights of [GAO-20-144](#), a report to the Committee on Transportation and Infrastructure, House of Representatives. View [GAO-20-144](#). For more information, contact Lori Rectanus at (202) 512-2834 or rectanusl@gao.gov.

Why GAO Did This Study

As the federal government's landlord, GSA spends hundreds of millions of dollars to construct or modernize federal buildings. By delivering these major construction projects, GSA supports tenant agencies' missions and facilitates the delivery of government services.

GAO was asked to review GSA's major construction projects. This report: (1) identifies costs of these projects in the last 5 years and factors that contribute to those costs; (2) examines how GSA monitors and publicly communicates cost and schedule information; and (3) assesses GSA's efforts to confirm that projects meet GSA's requirements and that tenants are satisfied with completed projects. GAO analyzed GSA's performance data from fiscal years 2014 to 2018 for 36 projects with a minimum cost each of \$20 million (i.e., a major construction project); selected five case-study projects representing diversity in project type, geographic area, building type, and range in cost and scope; reviewed applicable GSA policies, procedures, guidance, and reports; and interviewed GSA officials and project stakeholders.

What GAO Recommends

GAO is recommending that GSA (1) report the extent projects were rebaselined and their final costs; (2) update GSA's commissioning guidance; and (3) identify and communicate when and how to conduct POEs and share lessons learned. GSA concurred with two recommendations and partially concurred with the other, which GAO believes should be fully implemented as discussed in the report.

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GSA Can Improve Its Communication about and Assessment of Major Construction Projects

What GAO Found

In fiscal years 2014 through 2018, the General Services Administration (GSA) completed 36 major construction projects—projects with a minimum cost of \$20 million to construct new buildings or modernize existing buildings—with a total cost of \$3.2 billion. According to a GSA consultant, factors specific to federal construction projects may result in GSA's projects costing roughly 15 to 25 percent more than comparable private sector projects. For example, GSA uses more durable but more expensive materials to achieve a longer building service life compared to private owners who may plan for a shorter service life.

GSA's *Annual Performance Reports* to Congress do not indicate how much GSA "rebaselined" projects' schedules and costs. Rebaselining reestablishes the point at which GSA measures on-schedule and on-budget performance. In accordance with agency policy, GSA rebaselined 25 of 36 projects GAO reviewed to account for issues such as design changes and tenant-funded requests. For example, GSA rebaselined one of its modernization projects for a \$2.7 million increase to the construction contract initially awarded for \$21.8 million. The increase resulted from a design change to add a stairwell for fire safety purposes to accommodate the tenant's plan to increase the building's occupants (see figure). After GSA rebaselines a project, costs may differ from the project estimates approved by Congress. Because GSA does not report the extent that it has rebaselined projects or projects' final costs, Congress lacks information about GSA's performance: such as whether final costs are consistently above, below, or meeting estimated costs. Reporting such information could benefit Congress' ability to carry out its oversight role and improve transparency about the full costs of major federal construction projects.

GSA Building (Before) and Modernization Project Showing New Stairwell (After)



Source: GSA. | GAO-20-144

GSA assesses whether projects meet requirements and tenants' needs but does not fully capture or share lessons learned. For example, GSA uses "commissioning"—testing installed building systems—to validate that the buildings' systems function as designed. However, because GSA's 2005 commissioning guide references outdated guidance, the effectiveness of its activities may be limited in assuring buildings are operating optimally. GSA also uses post occupancy evaluations (POE) to assess projects' performance and tenants' satisfaction. However, in the last 5 years, GSA has not regularly conducted POEs, due in part to resource constraints, and lacks a policy for selecting projects for POEs and communicating findings from completed POEs. As a result, GSA may be missing opportunities to fully utilize POEs to gather tenants' feedback and inform the design and construction of future projects.

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Abbreviations

CMc	construction manager as constructor
design standards	<i>Facilities Standards for the Public Buildings Service</i>
EVM	earned value management
FISMA	Federal Information Security Modernization Act of 2014
GSA	General Services Administration
<i>Guide</i>	<i>The Building Commissioning Guide</i>
HVAC	heating, ventilation, and air-conditioning
LEED	Leadership in Energy and Environmental Design
NIBS	National Institute of Building Sciences
OMB	Office of Management and Budget
PMP	Project Management Plan
POE	post occupancy evaluation
Recovery Act	American Recovery and Reinvestment Act of 2009
R&A	repair and alteration

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December 12, 2019

The Honorable Peter A. DeFazio
Chairman
The Honorable Sam Graves
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

As the federal government's landlord, the General Services Administration (GSA) is responsible for providing federal agencies with buildings to help support their missions and facilitating the delivery of government services. As part of this effort, GSA annually spends hundreds of millions of dollars on major construction projects, which includes constructing new buildings and modernizing federal buildings. These costs, in addition to the long-term operation and maintenance costs of approximately 1,600 federally owned buildings under GSA's custody and control, create a significant fiscal exposure for the government.

You asked us to review issues related to GSA's major construction projects. This report:

- identifies the costs and key characteristics of GSA's major construction projects in the last 5 years, and what factors contribute to those costs;
- examines how GSA monitors and publicly communicates cost and schedule information about its major construction projects; and
- assesses GSA's efforts to confirm whether its major construction projects meet its requirements and whether tenants are satisfied with the completed projects.

To identify the costs and key characteristics of GSA's major construction projects in the last 5 years, we reviewed GSA projects to construct new buildings, and projects to modernize existing buildings (i.e., repair and alteration (R&A) projects) that were substantially completed in the 5-year period from fiscal years 2014 through 2018 with a construction contract

cost of \$20 million or more.¹ We reviewed GSA's internal performance data maintained to track the on-budget and on-schedule performance of these projects. We assessed the reliability of these data through electronic testing and interviews with GSA officials responsible for the data and determined that the data were reliable for the purpose of gathering project cost information and other key characteristics. From that data, we identified 36 projects that fit the above parameters, and analyzed the data to determine the costs and key characteristics of them.² In addition, to identify the factors that contribute to the costs of federal construction projects, we reviewed prior studies and evaluations of project costs, including an internal construction cost study prepared for GSA by the National Institute of Building Sciences (NIBS) in March 2016, and spoke with GSA and NIBS officials.

To examine how GSA monitors cost and schedule information during construction, and assess its efforts to confirm projects met GSA's requirements (e.g., such as those specified in its *Facilities Standards for the Public Buildings Service* (design standards)),³ and whether tenants were satisfied with completed projects, we judgmentally selected five projects as case studies from the list of 36 projects. Our case studies were selected to include diversity in project type (e.g., R&A and new construction), various GSA regions, different building types (e.g., courthouses, office buildings), and a range in project cost and scope. Although not generalizable to all GSA major construction projects, information gathered from our case studies provide illustrative examples of GSA's monitoring and construction efforts. For our case study projects, we interviewed stakeholders for these projects including GSA project managers, contractors, and the facility managers who operate the building. Additionally, we reviewed Project Management Plans (PMP)

¹GSA defines major acquisitions, such as construction projects, as those valued at \$20 million or more. Similarly, we determined that the \$20 million construction cost threshold includes major projects that have a substantial scope and also the potential to expose GSA to significant cost risk during projects' implementations should scope changes occur.

²Our analysis of costs focused on construction costs and did not include other costs such as for planning, design, and construction management and inspection that comprise a project's total cost. Our analysis of projects' key characteristics is not generalizable to GSA's major construction projects outside of the fiscal year 2014 through 2018 time frame.

³For the purposes of our report, when we refer to GSA's "design standards," we are referring to GSA's *P100 Facilities Standards for the Public Buildings Service*, which was most recently published in July 2018.

which outline projects' scope, cost, and schedule; and external peer reviews, which assess the status of the project. See appendix II for more information on our case study projects.

Outside of the information gathered from our case study projects, we also reviewed how GSA communicates cost and schedule information about its major construction projects in its public reporting through its *Annual Performance Reports*⁴ from fiscal years 2014 through 2018, in which GSA reports on its performance in delivering construction projects on-schedule and on-budget. We also reviewed an internal post occupancy evaluation (POE) summary report prepared by NIBS for GSA; this report examined lessons learned from six completed GSA projects in fiscal year 2018.

To further examine GSA's efforts to monitor and publicly report on its construction projects, we generally reviewed GSA's project management policies, guidance, and public reporting and federal internal control standards on implementing and reviewing program control activities and communicating necessary quality information—internally and externally—to achieve the entity's objectives.⁵ Lastly, to assess how GSA confirms its projects meet GSA's requirements and if tenants are satisfied with the projects, we reviewed GSA's project management policies and conducted interviews with stakeholders for our case study projects including GSA project managers, contractors, and the facility managers who operate the building. We also examined GSA's project management processes and actions with respect to federal capital-programming guidance on monitoring projects' costs and schedules (referred to as "earned value management") and conducting POEs to assess completed projects and identify lessons learned for future projects.⁶ We also reviewed GSA's *The Building Commissioning Guide (Guide)* governing its process for

⁴The GPRA Modernization Act requires agencies to provide updates to their published performance plan, which includes goals and performance indicators for each program activity. Pub. L. No. 111-352, 124 Stat. 3866 (2011). For GSA, it does this by issuing its *Annual Performance Plan and Annual Performance Reports*. For the purposes of our report, we will be referring to GSA's *Annual Performance Plan and Annual Performance Reports* as *Annual Performance Reports*.

⁵GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 2014).

⁶Office of Management and Budget (OMB), *Capital Programming Guide*, a supplement to OMB's annual Circular No. A-11, *Preparation, Submission, and Execution of the Budget*.

validating whether building systems are operating according to GSA's requirements.⁷

We conducted this performance audit from July 2018 to December 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The federal government is the largest real property owner in the United States with a vast inventory costing billions of dollars annually to operate and maintain. Federally owned buildings include courthouses, offices, warehouses, hospitals, housing, data centers, and laboratories. GSA acts as the federal government's landlord and is responsible for designing, constructing, and managing federal buildings that are occupied by federal agencies and the judiciary.

Each year, GSA spends hundreds of millions of dollars on major construction projects, which include both new construction and repairs and alterations (R&A) to existing federal buildings. R&A projects can range from building system replacements and security upgrades to full building renovations. GSA manages its major construction projects through its central office in Washington, D.C., and its 11 regional offices. GSA's central office establishes programming, design, and construction standards and guidance, and provides technical assistance, as needed, to the regional offices that are responsible for project implementation. To obtain authorization for projects above a defined threshold, GSA must submit to certain congressional committees a project prospectus that, among other items, describes the project and provides its estimated cost.⁸

⁷GSA, *The Building Commissioning Guide* (Washington, D.C.: April 2005).

⁸40 U.S.C. § 3307. The fiscal year 2018 threshold that triggers GSA's prospectus submittal requirement is \$3.095 million. In general, GSA's prospectuses typically identify the building that is the subject of the request and the estimated total project cost that includes costs for site acquisition (if any), design, construction, and management and inspection. In some cases, GSA may combine multiple projects among various buildings in a single "Special Emphasis Program" prospectus request, such as for space consolidation projects.

Upon approving a project's prospectus, Congress provides funding, either through an appropriation from the Federal Buildings Fund or appropriating funding to an agency.⁹ GSA posts approved project prospectuses on GSA's public website.¹⁰

In general, GSA develops and implements projects through a sequential process that includes the following steps:

- **Identification.** Federal agencies submit a facility or space need to GSA; GSA prepares a feasibility analysis to determine the best way to fulfill the need, which could be through new construction, an R&A project, or a lease. Some R&A projects—limited to building system replacements—may be identified by GSA based on building age and condition, and not originate from agencies' space needs.
- **Initiation.** GSA assigns a project manager to define the project's scope, develop cost and schedule estimates, and draft a project management plan (PMP). If a prospectus has not been previously submitted, GSA submits a prospectus to certain congressional committees for authorization.¹¹
- **Planning.** GSA's project manager updates the PMP; the project's baseline scope, schedule, and budget are finalized.
- **Execution.** For authorized and funded projects, GSA awards contracts for design and construction;¹² the project's baseline scope, schedule, and budget are revised, as needed, based on awarded contracts; GSA's project manager monitors design and construction

⁹The Public Buildings Act Amendments of 1972 established the Federal Buildings Fund into which GSA deposits rent collected from tenant agencies. Pub. L. No. 92-312, § 3, 86 Stat. 216, 218 (June 14, 1972), codified as amended at 40 U.S.C. § 592. Congress annually provides obligational authority to GSA for use of the Federal Building Fund's resources for the construction, operation, and maintenance of assets in its buildings portfolio. In some instances Congress may provide supplemental appropriations to GSA or to an agency to meet new construction or R&A needs. In cases where an agency receives an appropriation, it uses the appropriation to reimburse GSA for incurred costs.

¹⁰See <https://www.gsa.gov/real-estate/gsa-properties/capital-investment-and-leasing-program-prospectus-library>.

¹¹Depending on the project type and other considerations, GSA may submit separate or combined prospectus submissions in one or more fiscal years for site acquisition (if applicable), design, and construction.

¹²Based on the project's delivery method GSA decides to use, it may undertake design and construction through a single contract or through separate contracts. We discuss project delivery methods in more detail later in this report.

progress and manages changes to the project's scope, cost, or schedule.

- **Close-out.** GSA's project manager completes construction close-out activities and turns the project over for tenants' use.

GSA project managers perform key steps in the process that include overseeing contractors, monitoring and reporting on the progress of projects, managing changes to the project, and coordinating with tenant agencies. Additionally, GSA project managers are responsible for ensuring that "commissioning" is performed during the project. "Commissioning" generally requires that an independent commissioning agent oversee the construction contractor's testing of installed building components to determine if they are performing as designed.

GSA Obligated Over \$3 Billion to Major Construction Projects Completed in the Past 5 Years; Various Federal Requirements Contributed to Costs

GSA Obligated about \$3.2 Billion for Major Construction Projects

According to GSA data, GSA substantially completed 36 major construction projects in the 5-year period from fiscal year 2014 through fiscal year 2018.¹³ The total cost of those 36 projects was approximately \$3.2 billion. Listed below are some characteristics of those projects.¹⁴

- **Cost:** Project costs ranged between \$21 million and \$343 million, with an average cost of about \$89.3 million.¹⁵

¹³GSA considers a project to be substantially complete on the date the project space is suitable for tenant occupancy.

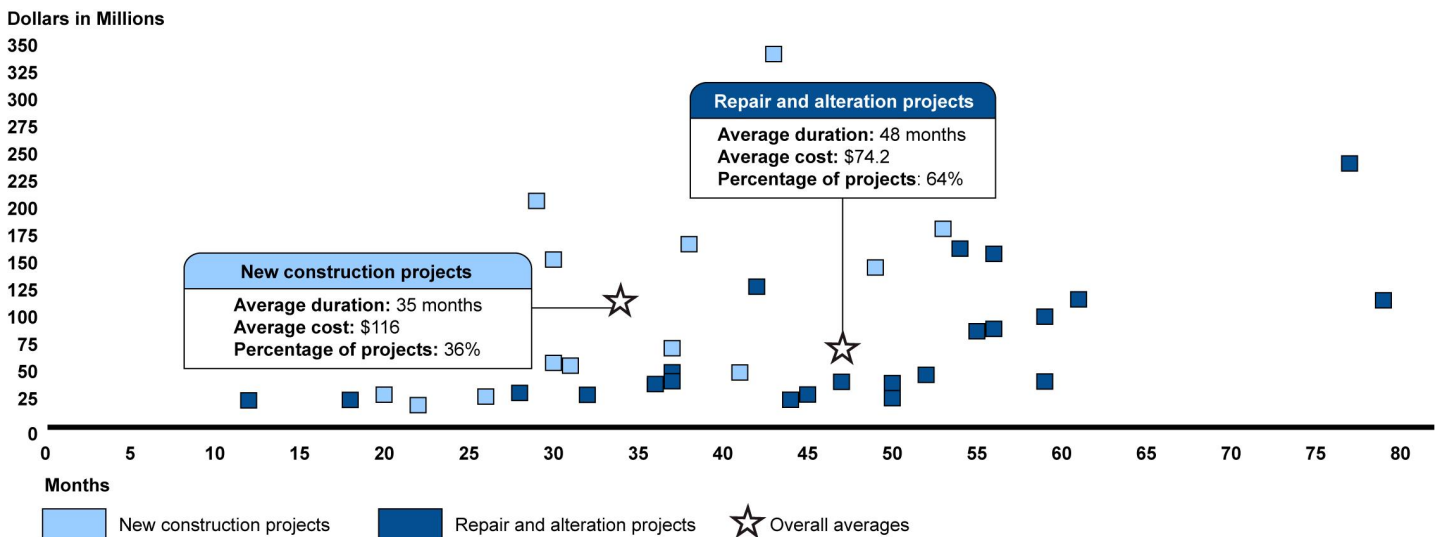
¹⁴These descriptive characteristics are not generalizable to all GSA major construction projects.

¹⁵The cost figures are based on GSA's "current award cost," which reflects the project's total construction obligations at the time the data were collected at the end of the fiscal year.

- **Schedule:** Project durations ranged between about 12 months and 79 months, with an average of about 43 months.
- **Project Type:** R&A projects made up the majority of projects (64 percent), with an average cost of about \$74.2 million and an average duration of about 47 months. New construction projects accounted for 36 percent, with an average cost of about \$116 million and an average duration of about 35 months. On average, R&A projects cost about \$42 million less than new construction projects but took about 13 months longer to complete.

See figure 1 for summary information on the cost and duration of these projects, by project type.

Figure 1: Costs and Duration of the General Services Administration’s (GSA) Major Construction Projects, Fiscal Years 2014–2018



Source: GAO analysis of GSA performance data. | GAO-20-144

Note: Construction costs are reported in nominal values based on when they were completed. The values have not been adjusted for inflation.

- **Location:** The National Capital Region¹⁶ (GSA Region 11) had the most projects with nine (25 percent), and all but one of the 11 GSA Regions had at least one project.
- **Project Delivery Method:** GSA utilized four delivery methods for 35 of the 36 projects in our 5-year time frame.¹⁷

¹⁶The National Capital Region includes Washington, D.C., and local jurisdictions in Maryland and Virginia.

- **Construction Manager as Constructor**, whereby GSA contracts separately with a design firm and a construction contractor. The construction contractor is involved early-on to consult on the design as it is being developed; upon the design's completion, GSA negotiates with the construction contractor on a price to undertake the construction. GSA used this method for 12 of the 36 projects (average cost of about \$99.8 million).
- **Design-Bid-Build**, whereby GSA contracts with a design firm to develop a project's design. After the design is completed, GSA contracts separately with a construction contractor. GSA used this method for 11 of the 36 projects (average cost of about \$81.3 million).
- **Design/Build-Bridging**, whereby GSA contracts with a construction contractor to finish a partially completed design—termed a “bridging design”—begun by a separately contracted design firm. GSA used this method for 8 of the 36 projects (average cost of about \$77.4 million).
- **Design/Build**, whereby GSA contracts with a contractor to provide both design and construction services under a single contract. GSA used this method for 4 of the 36 projects (average cost of about \$120.4 million).

See appendix I for more detailed information on each of the 36 projects.

GSA Identified Federal Design Requirements among Key Factors That Can Result in Higher GSA Construction Costs

According to GSA officials and GSA's internal construction-cost study prepared for GSA by the National Institute of Building Sciences (NIBS) in March 2016, several factors can result in higher costs for GSA's construction projects compared to other similar private sector construction projects.¹⁸ For example, cost models in the 2016 NIBS study indicate that

¹⁷GSA identified one project as a “service” project, which it defined as a project where the construction work was a subcomponent of the services GSA procured under the contract. The final cost of the construction work was about \$21 million.

¹⁸NIBS was authorized by statute to provide advice with respect to the use of building science and technology to both the government and the private sector. See Pub. L. No. 93-383, § 809 (1974). In conducting the cost study for GSA, NIBS developed cost models in accordance with GSA's design standards, and other applicable federal requirements in 2015. The models are based on 2015 construction costs in the Washington, D.C., area.

R&A projects cost roughly 15 to 25 percent more than R&A projects for a comparable Class A private sector building.¹⁹ Although the study was based on construction of R&A projects, both GSA and NIBS officials agreed that these same factors can contribute to similar cost premiums for GSA's new construction projects compared to private sector projects. However, the NIBS staff who conducted the study told us that GSA's more recent adoption of performance-based design standards, as compared to previously prescriptive standards, likely lowers the federal construction cost's premium relative to private sector projects but some premium still exists.²⁰ The performance-based design standards, for example, provide contractors greater latitude in selecting construction materials, which can have cost implications.²¹

According to the GSA's internal construction-cost study, the factors that contribute to higher estimated costs for GSA construction projects when compared to similar private sector projects primarily include design and procurement requirements specific to federal projects that private sector counterparts may not have to comply with. Those requirements are specified in GSA's design standards, as well as federal statutes and guidelines. Table 1 provides illustrative examples of factors cited by the study and GSA officials.

¹⁹There are three classes of buildings, Class A, B, and C, of which Class A is considered to be the highest quality. For example, Class A buildings have rents above average for the area, high-quality standard finishes, state-of-the-art systems, and exceptional accessibility and location.

²⁰GSA most recently issued its *P100 Facilities Standards for the Public Buildings Service* in July 2018.

²¹For example, NIBS officials indicated that GSA's older design standards prescribed that most electrical wiring had to be installed inside a rigid conduit; under GSA's current standards—a multi-tier, performance-based construct—some wiring may be installed inside a flexible conduit, at a lower cost.

Table 1: Factors That May Contribute to Higher Federal Construction Costs Compared to Private Sector Projects

Factors	Description or examples
General Services Administration's (GSA) design standards	GSA buildings are typically built for a 100-year service life. ^a As a result, more durable construction materials with longer lifecycles are likely to be used, but generally may be more expensive. By comparison, private sector owners may use less costly, lower quality materials if they do not plan to own the building as long.
Federal-contracting requirements	The Davis-Bacon Act, for example, requires workers on federal construction projects to be paid at or above the prevailing local wage rate, and private sector entities may not have to pay these rates. ^b Additionally, the lengthy federal procurement time frames compared to shorter time frames in the private sector can impose financial burdens and the risk of cost escalation on contractors that contribute to higher construction costs.
Federal sustainability mandates	The Energy Independence and Security Act of 2007, for example, generally authorizes agencies to evaluate and implement energy and water-system efficiency measures. ^c While such systems may be more efficient to operate over the life of the building, they may have higher initial costs to procure and install. These requirements generally equate to Leadership in Energy and Environmental Design (LEED) Gold performance. ^d A private-sector owner may choose to pursue a lower LEED certification, such as Silver, or no certification, which may result in lower construction costs.
GSA's First Impressions Program	The program seeks to enhance buildings' public entrances, lobbies, and plazas to create attractive visitor areas. ^e These areas shape a visitor's "first impression" of the federal government, and meeting the security and aesthetic design requirements of the program can increase costs for federal projects compared to private sector projects.
Federal blast protection and other physical security requirements	Federal buildings may need larger sites to provide sufficient setback from public streets to adhere to federal blast-protection requirements. In addition, requirements for visitor screening areas, metal detectors, guard desks, and x-ray machines may necessitate larger public lobbies that are comparatively more expensive to build than lobbies in privately owned office buildings.
Background checks and security clearances	Background checks—and in some cases obtaining security clearances—for contractors' design and construction personnel may also increase costs on federal projects. Administering background checks can add to contractors' overhead costs and presents schedule risks as obtaining a clearance, for example, can be a months-long process. ^f

Source: GAO presentation of information from the GSA Internal Construction Cost Study and GSA officials. | GAO-20-144

^aThe standards indicate that federal buildings have a longer life expectancy than most commercial office buildings. Forty percent of GSA's occupied inventory is over 50 years old, and many federal buildings are over 100 years old.

^bPub. L. No. 71-798 (1931), as amended.

^cPub. L. No. 110-140, § 432 (2007).

^dLEED is a green-building-rating system established by the U.S. Green Buildings Council that defines sustainable features for buildings and includes performance standards for four different certification levels. By meeting the standards during design and construction, projects can earn credits and become certified in accordance with an ascending four-level scale—Certified, Silver, Gold, and Platinum.

^eGSA's First Impressions Program intends to provide well-designed lobbies that serve building tenants and visitors by ensuring safety, creating a welcoming and accessible environment, representing the values of the agencies housed in the building, and providing legible and intuitive signage for wayfinding.

^fThe Department of Homeland Security requires contractor background checks on all federal construction projects. See Homeland Security Presidential Directive (HSPD)-12.

In addition to the factors identified in the GSA's internal construction-cost study, GSA officials said that meeting other statutory requirements, for example, the Buy American Act and the Federal Information Security Modernization Act of 2014 (FISMA), can contribute to higher costs for federal projects compared to private sector projects.²² GSA officials said that the cost of making information technology systems FISMA-compliant leads to federal projects costing more than private sector projects. FISMA-compliant systems, among other uses, are needed to enable the sharing of design and construction documents among GSA and contractor staff and the installation of control systems that are integral to the operation of building systems.

GSA Uses Various Tools to Monitor Construction Projects' Information, but the Agency's Public Reporting Provides Limited Insight into Cost and Schedule Changes

GSA Uses Three Primary Project Management Tools to Actively Monitor Construction Projects

GSA uses three principal tools—(1) project management plans (PMP), (2) peer reviews, and (3) “earned value management” (EVM)—to monitor its construction projects, including cost and schedule performance.

The PMP is the overarching tool GSA and its contractors use to guide projects' implementation. According to GSA policy, a PMP primarily defines the parameters of a project, to include scope, schedule, cost, implementation strategy, and risks, among other items.²³ GSA policy also indicates that the PMP—which is an industry recognized tool—is to be updated during a project's execution and reflect notable changes affecting

²²Buy American Act provisions generally require, among other things, that contracts for the construction of public buildings contain a provision that the use of materials be manufactured in the United States. 41 U.S.C. § 8303. Such provisions can increase the costs of federal projects as compared to private sector projects.

²³GSA, GSA Order-PBS 3425.12B, *Project Management in the Public Buildings Service*, April 20, 2016.

the project's scope, cost, and schedule.²⁴ The PMP is to also establish stakeholder roles and responsibilities, project goals, and tenant expectations.

In all of the five case-study projects we reviewed, we found the associated PMPs generally:

- outlined the project's scope, cost, and schedule information;
- identified GSA's project stakeholders—such as GSA's project manager and GSA's contracting officer—and representatives for the tenant agencies that the project will benefit; and
- identified potential risks posed to the delivery of the project.²⁵

Four of the five PMPs included a "revision history" table that demonstrated that GSA generally used and updated the PMPs over the course of the projects' execution. The fifth project's PMP was developed prior to GSA's 2012 update to its PMP standard format, which then required the use of a revision history log. More information pertaining to our case-study projects, including some information from the GSA PMPs we reviewed can be found in appendix II.

The second tool GSA utilizes to monitor its construction projects is peer reviews. GSA policy requires that external peer reviews be conducted on projects with a construction cost over \$25 million.²⁶ Per GSA guidance, these on-site peer reviews typically occur twice during construction—when projects are about 15 percent and 60 percent complete. External peers—typically, construction industry experts who were not involved with the project—assess whether a project is progressing as planned and identify for GSA managers and project stakeholders any issues they

²⁴Both GSA policy and the Construction Management Association of America, *Construction Management Standards of Practice* generally indicate a PMP should be approved by management; that the PMP is to be updated throughout the project; and that a PMP can be used to measure a team's performance and the project's success.

²⁵We conducted a broad review of the PMPs for our five case studies. We have previously reported on GSA's use of PMPs to identify and manage risks to projects. See GAO, *Federal Real Property, GSA Could Better Identify Risks of Unforeseen Conditions in Repair and Alteration Projects*, [GAO-16-273](#) (Washington, D.C.: Mar. 17, 2016).

²⁶GSA, GSA Order-PBS 3425.12B, *Project Management in the Public Buildings Service*, April 20, 2016.

observe that may affect its timely completion or cost.²⁷ In general, peers also assess stakeholders' working relationships and make recommendations for improvement or identify opportunities for greater consistency in the performance of GSA's construction program or greater efficiency among project stakeholders.

We found that four of our case-study projects utilized external peer reviews during construction, as required. For example, one peer review report included the following observations:

The project team showed great progress toward completing the project on time, and potentially ahead of schedule; the implementation of the recommendations made during the initial external peer review resolved potential unknowns and cost issues that would have put the project at high financial risk; the safety record was exceptional; tenants were better informed; and security issues had been streamlined, allowing the contractor to staff the project in a timely manner.

Most of the GSA's project managers and construction contractors we interviewed for these four case study projects said they generally believed the external peer reviews were fair and added value. Our fifth case-study project did not utilize an external peer review because it was not required at the time GSA awarded the construction contract.²⁸

The third tool GSA uses is EVM, which is an industry-recognized project management tool and is required for major federal acquisitions, such as construction projects, to help project managers monitor cost and schedule during project execution.²⁹ According to the Office of Management and Budget's (OMB) guidance and GAO's cost-estimating guide, EVM measures the value of work accomplished in a given period and compares it with the planned value of work scheduled for that period and

²⁷Peers are selected by GSA, with the assistance of the Associated General Contractors of America, and appointed by the GSA Commissioner of the Public Buildings Service for a period of 2 years.

²⁸GSA's 1990 project management policy that applied prior to its 2016 policy update did not require the use of external peer reviews.

²⁹48 C.F.R. § 34.201(a). Per the GSA Acquisition Manual—a supplement to the Federal Acquisition Regulation—GSA defines major acquisitions for EVM purposes as GSA acquisitions valued at \$20 million or more.

the actual cost of work accomplished in that period.³⁰ The differences between the estimated and actual costs and schedule are used to determine, for example, whether less or more work had been completed than had been planned. By tracking these differences, EVM can provide warning signs of impending cost overruns or schedule delays and provide estimates of anticipated costs at completion.³¹

Consistent with our previous findings related to GSA's use of EVM, we found that GSA continues to use EVM to assess its construction project delivery performance on two dimensions—on-schedule and on-budget:³²

- **On schedule:** GSA considers a construction project to be on-schedule if its construction duration is within 10 percent of the planned duration, from the construction start date to the substantial completion date (i.e., GSA considers a project to be substantially complete on the date the project space is suitable for tenant occupancy; however, the project's cost could change prior to the actual contract close-out).³³
- **On budget:** GSA considers a construction project to be on budget if its actual cost is within the planned construction cost (as measured by the construction contract's value at award or the contract value as adjusted based on post-award contract modifications) and the additional 7 to 10 percent construction contingency.³⁴ According to GSA guidance, a project's construction contingency is intended to

³⁰OMB's *Capital Programming Guide*, supplemental guidance contained in OMB's annual Circular No. A-11, *Preparation, Submission, and Execution of the Budget*; and GAO, *GAO Cost Estimating and Assessment Guide*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

³¹Positive differences indicate that activities are costing less or are completed ahead of schedule. Negative differences indicate activities are costing more or are falling behind schedule. EVM also allows individuals outside the project to see a standardized metric describing the cost and schedule performance of a particular project and compare it consistently with other projects. See [GAO-09-3SP](#).

³²GAO, *GSA Is Taking Steps to Improve Collection and Reporting of Repair and Alteration Projects' Information*, [GAO-18-595](#) (Washington, D.C.: July 23, 2018).

³³For projects that are in progress, GSA compares the planned schedule of spending (i.e., work that its contractor planned to complete) to the actual value of the work in place (i.e., work that its contractor has completed). By comparing actual spending to planned spending, GSA can determine if its in-progress construction projects are ahead, on, or behind schedule.

³⁴Accordingly, measuring on-budget performance is not an assessment of the total project's budget, which may include costs for site acquisition, design, construction, and project management and inspection. GSA's standard construction cost contingency is 7 percent for new building projects and 10 percent for R&A projects.

cover unforeseen conditions and design deficiencies; it does not apply to additional scope.

According to GSA officials, GSA's central office uses EVM to conduct monthly performance reviews of GSA's major construction projects.³⁵ At these reviews, GSA's central office considers certain proposed project changes forwarded for approval by GSA regional offices.³⁶ We have previously reported that federal construction projects typically involve some degree of change as the project progresses and that contract changes, made through contract modifications, can occur for a variety of reasons, including design errors and unforeseen site conditions.³⁷ In addition, GSA officials said that funding delays, tenant-caused delays, and site acquisition issues can also be factors that cause project delays. According to GSA guidance, while GSA regional offices have some latitude to make contract changes, the regional offices and their project managers must get central office approval if a proposed change is anticipated to exceed the approved contract cost, construction contingency, or schedule contingency. If such a change is approved, GSA will then revise—commonly referred to as “rebaseline”—either the construction contract cost, the planned schedule duration, or both. GSA will then use that new value to measure and report on the project's budget and schedule performance.³⁸

According to GSA officials and summary data on its rebaselining decisions, the majority of GSA's major construction projects within our 5-year scope were rebaselined, within its policy, to account for changes to projects' costs and schedules. Specifically, GSA officials told us they rebaselined 25 of the 36 projects (about 70 percent). Of those projects, 18 (50 percent) were driven, at least in part, by tenant-requested changes, which GSA officials said were the most prevalent reasons for rebaselining a project. According to GSA policy, if a tenant agency

³⁵GSA reported that EVM data are managed through GSA's electronic project management database and that both regional and central office staff review data every month in support of formal monthly performance measure tracking and reporting.

³⁶This is called the Construction Measures Adjudication Process.

³⁷GAO, *Federal Construction: Army Corps of Engineers and GSA Need to Improve Data on Contract Changes*, [GAO-19-500](#) (Washington, D.C.: July 2, 2019), and [GAO-16-273](#).

³⁸The GSA panel responsible for approving or disapproving a rebaseline request includes GSA's Public Buildings Service Deputy Commissioner and other GSA central office officials including an Office of Design and Construction representative, a budget analyst, a program analyst, and the rebaselining coordinator.

requests a project change that falls outside the original scope, the project manager is to ensure that the tenant agency provides all the associated design-related requirements and funding necessary to perform this additional scope.³⁹ For example, for one of our case study projects, the tenant provided \$17.7 million in additional funding as part of the final phase of its headquarters building's multi-year modernization. The tenant's funds paid for, among other things, the tenant-requested change to convert part of the multi-story library into offices to increase the building's space efficiency and allow more staff to move into the building.

Based on our review of GSA's internal data, we found that four of our five case-study projects were rebaselined; GSA rebaselined the cost of two projects, the schedule of one project, and both the cost and schedule of one project. For example, concerning costs, GSA rebaselined one project to account for a \$2.7 million increase to the contract—initially awarded for \$21.8 million—upon realizing that the tenant's plan to increase the number of occupants in the building required another stairwell be added for fire safety purposes.⁴⁰ With regard to schedule, GSA rebaselined one project, as previously discussed, to address a tenant-requested change to convert parts of the library into offices; this change extended the schedule by about 1 year.⁴¹ Given GSA's methodology that allows for rebaselining and GSA's cost and schedule contingencies, GSA's EVM performance data showed that all five case-study projects were completed on budget and on schedule, if not early.⁴² See appendix II for a summary of the cost and schedule performance of our five case-study projects.

³⁹GSA, *Project Management in the Public Buildings Service, PBS 3425.12B* (Apr. 20, 2016). GSA project managers do not have the unilateral authority to change the scope of the contract. The project manager must communicate any scope impacts to the project sponsor (typically a GSA Project Executive), GSA's contracting officer, and other senior program managers and key stakeholders in a timely manner.

⁴⁰If additional funding is needed for a project and the scope of the project has not changed, GSA's Public Buildings Service Commissioner is authorized to approve a request for an escalation of up to 10 percent above the approved prospectus amount (i.e., total project funding, not just construction funding). 40 U.S.C. § 3307(c). According to GSA documentation, should the need for additional funding exceed GSA's 10 percent allowance, GSA would have to request the additional funds (reprogramming of funds from the Federal Buildings Fund) from congressional subcommittees. According to GSA officials, escalations to increase project funding are not common. For example, two of the 36 major construction projects we analyzed required an escalation.
















⁴¹This scope change also resulted in a rebaselining of the project's cost.

⁴²EVM performance data may reflect that GSA applied some or all of the cost or schedule contingencies allotted to a project.

GSA’s Public Reporting on Project Performance Has Improved but Final Cost and Schedule Information Could be More Transparent

Federal agencies should report pertinent and reliable information to the Congress, so that Congress can adequately assess agencies’ progress in meeting established performance goals, ensure accountability for results, and understand how individual programs and activities fit within a broader portfolio of federal efforts to aid in federal funding decisions.⁴³ GSA has publicly reported high-level information on its construction project performance in its *Annual Performance Reports*, which GSA provides to Congress and publishes on GSA’s website.⁴⁴ For example, GSA’s fiscal year 2014 through 2018 *Annual Performance Reports* show that GSA met or exceeded its stated performance targets for project delivery (see fig. 2).

Figure 2: Comparisons of the Performance of the General Services Administration’s (GSA) Construction Projects’ Information Reported in GSA’s Annual Performance Reports, Fiscal Years 2014–2018

GSA reported data	2014	2015	2016	2017	2018
Performance target	 90%	 90%	 90%	 90%	 90%
Result ^a	 97%	 98%	 98%	 99%	 90%
Information GSA used in its performance calculation					
• On-schedule projects					
• On-schedule and On-budget projects					

Source: GAO analysis of GSA’s capital project performance measure in its fiscal year 2014 through 2018 *Annual Performance Reports*. | GAO-20-144

^aResults include both ongoing projects and projects completed in that fiscal year.

⁴³GAO, *Managing for Results: A Guide for Using the GPRA Modernization Act to Help Inform Congressional Decision Making*, [GAO-12-621SP](#) (Washington, D.C.: June 15, 2012).

⁴⁴The GPRA Modernization Act requires agencies to provide updates to their published performance plan, which includes goals and performance indicators for each program activity. Pub. L. No. 111-352, 124 Stat. 3866 (2011).

Over this period (fiscal year 2014 through 2018), GSA took steps to improve the content and usefulness of its annual reports. For example, in fiscal year 2014, GSA included R&A projects in its performance measure to fully encompass all GSA capital construction projects. Prior to fiscal year 2014, GSA's performance measure was calculated solely on the performance of GSA's new construction projects. Also, starting in fiscal year 2017, GSA included additional summary-level information in its reports that identified the total number of projects and total contract value of both completed and ongoing projects that fiscal year.⁴⁵ In fiscal year 2018, as shown in figure 2, GSA again revised its performance measure to reflect both the budget and schedule performance of projects. Prior to fiscal year 2018, GSA's performance measure reflected only projects' schedule performance. Further, in its fiscal year 2018 report, GSA listed the specific costs of its seven largest projects completed on-schedule and on-budget of the 24 projects completed that year.⁴⁶

While GSA has taken some actions to improve the usefulness of its external reporting, neither GSA's *Annual Performance Reports* nor its public prospectus website provide information on the extent to which projects have been rebaselined or the final costs of projects.⁴⁷ *Standards for Internal Control in the Federal Government* state that agencies should provide necessary quality information to external stakeholders so that the external parties can help the agency achieve its mission and address related risks.⁴⁸ As noted above, GSA regularly rebaselines projects, within policy, to account for changes to projects that affect construction contract

⁴⁵For example, in fiscal year 2018, GSA reported that 88 projects valued at \$3.2 billion were in construction or substantially complete. This total was comprised of all prospectus-level projects (i.e., projects that have an estimated cost greater than \$3.095 million). Of these, GSA reported that 24 projects valued at \$435 million in total reached substantial completion in fiscal year 2018. GSA considers a project to be substantially complete on the date the project space is suitable for tenant occupancy.

⁴⁶For example, GSA reported that the construction cost of the new U.S. Courthouse for the Southern District of Alabama, in Mobile, Alabama, was \$72.6 million at substantial completion. Because of contract actions that may occur following the project's substantial completion, the \$72.6 million cost that GSA reported may not reflect the final contract cost.

⁴⁷GSA's annual performance reports are available at: <https://www.gsa.gov/reference/reports/budget-performance/annual-reports>. GSA's project prospectuses are available at: <https://www.gsa.gov/real-estate/gsa-properties/capital-investment-and-leasing-program-prospectus-library>.

⁴⁸[GAO-14-704G](#).

costs and schedules due to a variety of reasons.⁴⁹ GSA officials told us that they manage total project costs to be within the original prospectus estimate provided to Congress adjusted, as applicable, by funds it receives for tenant-requested changes; the officials do not believe that it is critical to report final costs or if projects have been rebaselined.

However, we have found that simply measuring and reporting performance based on the most recent baseline may obscure how projects have performed over their entire construction time frame. Being more transparent about which projects or how many projects were rebaselined, as well as reporting cost and schedule growth from original baselines, can provide stakeholders with a more accurate view of project performance and enhance accountability.⁵⁰ Reporting on such cost information, for example, would allow GSA to communicate to Congress actual construction costs at a project's completion that may be different than the estimated costs on the prospectus approved by Congress at the project's initiation which likely did not account for items to be funded by tenants. Without that information, it is not possible for Congress to know how projects performed against approved estimated costs and whether final project costs are consistently above, below, or meeting estimated costs. Having this information could benefit Congress in its oversight role and in making future funding decisions.

GSA Assesses Whether Projects Have Met Requirements, but Does Not Fully Capture or Share Lessons Learned

GSA Uses Commissioning to Test Building Systems, but Its Guidance Is Outdated

In general, building commissioning is an industry-recognized quality assurance process for validating that the building's performance and

⁴⁹GSA may make changes for reasons such as design errors or unforeseen site conditions. In addition, GSA may make changes in response to requests made and funded by tenant agencies.

⁵⁰See GAO, *NASA: Assessments of Selected Large-Scale Projects*, [GAO-14-338SP](#) (Washington, D.C.: April 15, 2014); and *Defense Acquisitions: Information for Congress on Performance of Major Programs Can Be More Complete, Timely, and Accessible*, [GAO-05-182](#) (Washington, D.C.: Mar. 28, 2005).

systems meet the designer's intent and owner's and tenants' requirements. GSA's 2005 *The Building Commissioning Guide (Guide)* indicates that starting in 2006, projects requiring a prospectus—which would include all projects we defined as major construction projects—shall adopt “Total Building Commissioning” (commissioning) beginning with the project's planning stage and concluding with the post occupancy evaluation (POE).⁵¹ The *Guide* outlines which building systems should be commissioned, as well as the roles and responsibilities of various commissioning stakeholders, such as the GSA project manager, maintenance personnel, construction manager, independent commissioning agent, construction contractor, design team, tenant

⁵¹GSA, *The Building Commissioning Guide* (Washington, D.C.: April 2005).

Key Challenges Identified during Commissioning of Case Study Projects

Issues with State-of-the-Art Building Systems

State-of-the-art building systems and the automation systems that monitor and control them were not optimally operating for at least two of our case-study projects at substantial completion.

For example, stakeholders for one project reported that it was very challenging to get all the integrated systems to work properly, in part, because the design was very technologically advanced. One GSA official said the biggest challenge was coordinating the operations sequence of the various building systems to function as the design team intended. As such, it took well over a year after the building was completed to resolve these issues.

Limited Capabilities of Building Contractors to Maintain Complex Systems

In three of the five case-study projects, stakeholders said maintenance service contractors were either not prepared to assume or had not yet been contracted to provide for the higher technical maintenance and operation responsibilities for all the building systems.

For example, one construction contractor said there seemed to be a knowledge gap between the technical capabilities needed to effectively manage the more advanced building systems and the skills possessed by the existing maintenance contractor. A GSA official said that GSA plans to solicit a new contract for the building's maintenance.

Source: GAO analysis of information obtained from case study projects interviews with GSA officials and project construction contractors. | GAO-20-144

agencies, and others.⁵² The *Guide* identifies its primary audience to be: GSA's project managers, their construction management agents who help GSA manage the project, and the commissioning agent who oversees the commissioning process. The *Guide's* secondary audience includes the many other stakeholders in the commissioning process, including tenant agencies. According to the *Guide*, the commissioning process is intended to assist in preparing maintenance personnel to operate and maintain any newly installed building systems.

We found that GSA conducted commissioning largely in alignment with the *Guide* on our five case-study projects based on our review of project documentation and interviews with GSA's project managers, facilities managers, and contractors. Further, we identified two key challenges in regard to state-of-the-art building systems' and building contractors' capabilities.⁵³ See sidebar for additional information on the two challenges.

While GSA generally conducted commissioning according to its *Guide* on the five case-study projects we reviewed, we found that the 2005 *Guide* is outdated. For example, the *Guide* references dated industry practices and some outdated external guidance, both of which were in existence at the time the *Guide* was developed. Specifically, it references the 2003 Leadership in Energy and Environmental Design (LEED), *Green Building Rating System*, Version 2.1;⁵⁴ however, the LEED rating system for projects since 2016 was Version 4.0, and Version 4.1 was recently issued

⁵²Included in the more than 20 building systems specified for commissioning are heating, ventilation, air-conditioning, electrical, and plumbing systems; emergency systems and power generators; and the exterior building envelope, which includes exterior walls, roofing, windows and doors.

⁵³We have previously reported on similar commissioning and operational challenges with federal construction projects. See GAO, *Federal Buildings: GSA Should Establish Goals and Performance Measures to Manage the Smart Buildings Program*, [GAO-18-200](#) (Washington, D.C.: Jan. 30, 2018), and GAO, *New Embassy Compounds: State Faces Challenges in Sizing Facilities and Providing for Operations and Maintenance Requirements*, [GAO-10-689](#) (Washington, D.C.: July 20, 2010).

⁵⁴LEED is a green building rating system established by the U.S. Green Buildings Council that defines sustainable features for buildings and includes performance standards for four different certification levels. By meeting the standards during design and construction, projects can earn credits and become certified in accordance with an ascending four-level scale—Certified, Silver, Gold, and Platinum.

in 2019.⁵⁵ We also found disconnects between the 2005 *Guide* and GSA's current design standards or industry practices. For example:

- While the *Guide* states that GSA buildings should be LEED certified and strive for a Silver certification, GSA now requires buildings to achieve a higher certification, LEED Gold.⁵⁶
- The *Guide* states that GSA “strongly recommends” that GSA regions—and agencies to which GSA has delegated the operations of federal buildings—recommission buildings every 3 to 5 years.⁵⁷ The current LEED standards call for “periodic commissioning requirements, ongoing commissioning tasks, and continuous tasks for critical facilities.”
- In general, over the past decade, federal statutes, guidance, executive orders, and changes to industry building certifications have moved the federal government and the industry toward more real-time, continuous monitoring and commissioning in cases where advanced building-automation systems, energy information-management systems, and advanced meters (e.g., electrical, water, gas, temperature, and light meters) have been installed.⁵⁸ The continuous data provided by these systems can help building owners make real-time adjustments to optimize building operations. However, the *Guide* does not mention continuous monitoring-based commissioning as a possible option to, or in addition to, recommissioning buildings.

⁵⁵Also, the *Guide* references the 1996 HVAC Commissioning Process guideline, which has since been withdrawn and replaced with a 2007 update. ASHRAE Guideline 1.1-2007, *HVAC&R Technical Requirements for The Commissioning Process*. In 2013 and the recent update in 2018, ASHRAE also issued its *Standard 202-2013 and 202-2018—Commissioning Process for Buildings and Systems*. ASHRAE—formerly the American Society of Heating, Refrigerating and Air-Conditioning Engineers—publishes industry recognized standards and guidance focused on mechanical systems, energy efficiency, indoor air quality, refrigeration, and sustainability.

⁵⁶GSA, *P100 Facilities Standards for the Public Buildings Service*, July 2018.

⁵⁷GSA's *Guide* also states that buildings are to be recommissioned to help assure they continue to operate as intended, over the life of the facility.

⁵⁸For example, see Energy Independence and Security Act of 2007, Pub. L. No. 110-140, §§ 431-441 (2007); The Council on Environmental Quality, *Guiding Principles for Sustainable Federal Buildings and Associated Instructions* (February 2016); *Efficient Federal Operations*, Exec. Order 13834, 83 Fed. Reg. 23771 (May 22, 2018); and U.S. Green Building Council, Leadership in Energy and Environmental Design (LEED), *LEED, v4 for Building Design and Construction* (updated Jan. 11, 2019).

Standards for Internal Control in the Federal Government state that management should periodically review policies, procedures, and related control activities for continued relevance and effectiveness in achieving the entity's objectives or addressing related risks. Those standards also indicate that if there is a significant change in an entity's process, management should review this process in a timely manner after the change to determine that the control activities are designed and implemented appropriately.⁵⁹ Without updated guidance, GSA's commissioning activities may be limited in their effectiveness in assuring building systems are operating optimally. Two of the five GSA contractors we interviewed expressed frustration that the commissioning process on their projects did not run smoothly. GSA's external peer reviews for those same two projects also found that the roles of the various stakeholders in the commissioning process were not clear. In addition, three stakeholders on one of those projects said that some stakeholders—especially GSA's contracted design team—were not fully involved during part of building's commissioning. In light of our review, GSA is planning to evaluate its commissioning guidance to determine an appropriate update. GSA officials stated that this update may result in revising the existing commissioning guide or replacing it with industry-recognized guidance. However, GSA is still in the process of identifying the scope of the update, including a timeline and resources required to do so.

GSA Intermittently Conducts POEs but Lacks Established Policies and Procedures and a Formal Mechanism for Sharing Lessons Learned

According to OMB guidance, Post Occupancy Evaluations (POE) are tools to evaluate the effectiveness of an agency's overall capital acquisition process.⁶⁰ The primary objectives of a POE include (1) identifying how accurately a project meets its objectives, expected benefits, and strategic goals of the agency and (2) ensuring the continual improvement of an agency's capital-programming process based on lessons learned. The guidance also states that agencies should have a documented methodology for conducting POEs to ensure that each asset is evaluated consistently. The guidance identifies 17 factors to be

⁵⁹[GAO-14-704G](#).

⁶⁰Office of Management and Budget (OMB), *Capital Programming Guide*, a supplement to OMB's annual Circular No. A-11, *Preparation, Submission, and Execution of the Budget*.

considered for evaluation in conducting a POE, such as a project's performance, compliance with design standards, maintenance issues and building workforce competences, use of advanced building technologies, tenant satisfaction, and cost savings. The guidance also notes that a POE should generally be conducted 12 months after the project has been occupied to allow time for the tenant to evaluate the building's performance and the delivery of the project. However, the guidance allows agencies some flexibility in the timing of a POE to meet their unique needs if 12 months is not the optimal timing to conduct the evaluation.

We found GSA did not conduct any POEs on its completed major construction projects in the 4-year period from 2014 to 2017, as called for by OMB guidance. In fiscal year 2018, GSA contracted with the National Institute of Building Sciences (NIBS) to conduct six POEs and seven additional POEs in fiscal year 2019.⁶¹ GSA officials told us that while they understand the value POEs can provide, they are only able to conduct them when funding is available. They explained that POEs are funded through general program funding (not project funding based on the approved prospectus) within GSA's Office of Facilities Management, and the available resources to conduct such efforts are limited given other GSA portfolio-wide maintenance and operations priorities. GSA acknowledged that it did not have a specific policy for conducting POEs or selecting completed projects for POEs.⁶² Instead, GSA officials said when selecting which buildings should undergo a POE, they ensure there is a representation of different building types (i.e., federal buildings, U.S. courthouses, and land ports of entry) and a mix of new and R&A projects.

⁶¹Of the six projects on which NIBS conducted POEs in 2018, three are included in the 36 major construction projects GSA completed in our 5-year time frame.

⁶²We identified some other federal agencies with major construction responsibilities that have formal POE policies or guidance, including: U.S. Army Corps of Engineers (Standard Operating Procedure, USACE-COS-07, Post Occupancy Reviews, ER 1110-3-113, 21, Apr. 2016; National Aeronautics and Space Administration, *NASA Post Occupancy Evaluation Guidebook* (Feb. 18, 2014); and National Institutes for Health, NIH Facilities Development Manual, Section 7-4, Post Occupancy Survey (policy) and Appendix C, Post Occupancy Evaluation Guidance.

Because GSA does not have a policy for POEs, NIBS developed a general methodology, which it used for conducting each of those POEs.⁶³

While GSA tries to ensure there is a mix of projects represented when selecting POEs, it is not clear that its selection factors help ensure GSA makes the best use of its limited resources. To balance OMB's guidance to agencies that POEs should be conducted on agencies' completed capital-construction projects, and given its resource constraints, GSA could benefit from a more strategic approach to select the projects for POEs. For example, GSA could use a risk-based approach to select for POEs (e.g., more expensive projects or those that include the integration of advanced, state-of-the-art building systems) to help improve the design and construction of future projects. Such an approach is consistent with the *Standards for Internal Control in the Federal Government*, which states that management should design control activities to achieve objectives and respond to risks and implement those control activities through policies. Control activities could include establishing criteria for selecting projects for POEs and formalizing it through policy.⁶⁴

GSA officials also noted that GSA has conducted multi-building studies—which share some similarities with individual building POEs—that GSA officials broadly consider to be POEs.⁶⁵ However, while the studies assessed some of the factors described in OMB guidance (e.g., project performance, maintenance, or advanced technology use), none of them comprehensively reviewed the 36 projects in our 5-year time frame.⁶⁶

⁶³NIBS conducted 3-day site visits to each of the six projects to evaluate spaces and systems. As part of the site visits, NIBS conducted interviews with GSA staff, maintenance contractors, building tenants, and others. Prior to the site visits, NIBS also reviewed project documentation and questionnaires completed by facility staff and tenants.

⁶⁴[GAO-14-704G](#).

⁶⁵Those studies—sponsored by GSA—include: Department of Energy, Pacific Northwest National Laboratory, *Re-assessing Green Building Performance: A Post Occupancy Evaluation of 22 GSA Buildings*, September 2011; Cheng, Renée. School of Architecture, University of Minnesota. *Integration at its Finest: Success in High-Performance Building Design and Project Delivery in the Federal Sector*, April 14, 2015 (Volume 1) and January 2018 (Volume 2); Cheng, Renée. School of Architecture, University of Minnesota. *Teams Matter: Lessons Learned from ARRA*, May 2016; and, GSA, *The Impact of High-Performance Buildings* (June 2018).

⁶⁶The studies examined topics such as how team collaboration may affect projects' outcomes and how GSA's high-performance buildings compare to older buildings that have not been upgraded. Those studies included 4 of 36 major construction projects GSA completed in our 5-year time frame.

Accordingly, while these broader studies can provide some useful information to GSA, they are limited in their ability to provide GSA with timely information that meets the POE goal stated in OMB's guidance: "to evaluate the overall effectiveness of the agency's capital planning and acquisition process" and to "solicit customer feedback and incorporate that feedback into improvements to the performance and delivery of the capital investment process."⁶⁷

OMB guidance states that agencies should establish mechanisms to use lessons learned from POEs to minimize risks of repeating past mistakes on future projects. Along these lines, NIBS produced a summary report for GSA of the six 2018 POEs it conducted; the report identified design, construction, commissioning, and operational maintenance issues and lessons learned.⁶⁸ From these lessons learned, NIBS also offered some recommendations to GSA. For example, NIBS said that GSA should establish a POE review committee to examine GSA's building designs to highlight and offer solutions to previously identified problems in other buildings and develop and distribute a checklist describing the identified problems to teams that are responsible for designing new buildings. GSA developed an operational guide to synopsise the lessons learned from the NIBS report and expects that future building projects will benefit through its efforts to incorporate these lessons in the design of future projects.⁶⁹ Further, NIBS reported that improvements to future projects in response to the issues identified in the six 2018 POE projects would result in reductions to GSA's future operational costs. However, it is unclear whether the extent of these issues and lessons learned are unique to the 2018 POE projects reviewed by NIBS, or may be occurring across more of GSA's construction projects. According to NIBS officials, they have observed some recurring project issues among the six POEs conducted in fiscal year 2018 and two of the seven conducted in fiscal year 2019. GSA officials said that they plan to implement lessons learned from these POEs into GSA's design standards by the end of 2019 and expect to later update these design standards based on future POEs.

⁶⁷OMB, *Capital Programming Guide*, a supplement to OMB's annual Circular No. A-11, *Preparation, Submission, and Execution of the Budget*.

⁶⁸National Institute of Building Sciences, *Lessons Learned from the U.S. General Services Administration 2018 Post Occupancy Evaluation Program*, October 2018 [unpublished].

⁶⁹GSA, *Design Guide for Operational Excellence* (Washington, DC: May 6, 2019).

According to GSA officials, they made NIBS's individual POE reports and the 2018 POE summary report available to their project managers through a shared folder on GSA's internal intranet site, which can be accessed by over 120 staff. In addition, one GSA project manager told us that GSA periodically holds knowledge-sharing webinars with its project managers where lessons learned from specific projects may be presented. This official indicated that the knowledge-sharing presentations are heavy on photos and that there is no real prescribed format or requirements for content. Accordingly, the presentations are an informal way for project teams to share project knowledge across GSA's regions. Further, this official said the lessons-learned presentations from those webinars are also posted for a period of time on GSA's internal website. However, communicating information via such means provides ad-hoc benefits to only the select individuals who know about the availability of the reports or webinars, and choose to access them. This approach may not effectively expand the broader knowledge base of the organization or best position GSA to, as OMB guidance indicates, ensure continual improvement of an agency's capital-programming process based on lessons learned. *Standards for Internal Control in the Federal Government* also indicate that management should communicate necessary quality information to all relevant internal stakeholders to achieve the entity's objectives.⁷⁰

Without a sustained effort to consistently conduct POEs on its completed projects, GSA may miss opportunities to gather valuable tenant feedback and to identify marked successes or notable problems, including any issues that are recurring. Such information could inform future improvements to GSA's major construction projects and increase tenant satisfaction. Further, such information may also help identify the need to change or update some of GSA's policies, standards, guidance, or practices, such as those recommended by NIBS or other project stakeholders. However, even if GSA undertakes a more systematic approach to conducting POEs, the benefits of doing so can only fully materialize if GSA takes steps to effectively communicate POE lessons learned to all staff who may be at risk of repeating previously identified project mistakes.

⁷⁰[GAO-14-704G](#).

Conclusions

GSA annually spends hundreds of millions of dollars on major construction projects to provide tenant agencies with new buildings and modernized spaces that help support agencies' missions and enable the effective delivery of government services. GSA has improved its public reporting on major construction projects to depict project schedule and budget performance over time. However, GSA's public reporting does not include information about the extent to which projects' schedule or costs were rebaselined, or on projects' final costs, which may differ from GSA's estimates in the initial prospectuses approved by Congress. Providing the additional information on projects' schedule and cost rebaselining, and projects' final costs could further benefit Congress in its oversight role and improve public knowledge about the full costs of major federal construction projects. In addition, given the significant fiscal exposure for the government to maintain these buildings for the long term, having updated guidance on commissioning would enable GSA to better ensure that completed projects are meeting GSA's design standards. Finally, given resource constraints, identifying and communicating information about when and how POEs are to be conducted could help GSA maximize opportunities to capture lessons learned from completed projects. Knowledge gained from POEs could also ensure tenant agencies are satisfied with completed projects and improve the design and construction of major projects in the future.

Recommendations for Executive Action

We are making the following three recommendations to GSA:

The Administrator of the GSA should report for Congress and the public—for example, on GSA's prospectus website—the extent to which completed projects' construction costs and schedules were rebaselined and final construction costs, to include any additional funding tenant agencies may have provided to GSA for changes. (Recommendation 1)

The Administrator of the GSA should update its 2005 Commissioning Guide—or replace it with appropriate industry-recognized standards and guidance—to be consistent with GSA's current design standards and industry practices. (Recommendation 2)

The Administrator of the GSA should identify and communicate—such as through policy, guidance, or other appropriate mechanism—(a) when and how Post Occupancy Evaluations should be conducted for completed projects considering resource constraints and (b) how recommendations or lessons learned from those evaluations are effectively communicated to future project teams. (Recommendation 3)

Agency Comments and Our Evaluation

We provided a draft of this report to GSA for review and comment. In written comments, reproduced in appendix III, GSA stated that it partially concurred with recommendation 1 and concurred with recommendations 2 and 3, and provided related comments.

In response to recommendation 1, GSA agreed to publish key information that would be helpful, such as GSA's total construction costs at project completion. However, GSA said it would be misleading to publish information on additional funds provided to GSA from tenant agencies—that lead to contract changes and rebaselining—because these funds come from different appropriations. GSA believes this would not accurately reflect how GSA managed its original budget and schedule. However, we believe that reporting total project costs in a way that clearly identifies both GSA and tenant agency costs is possible, and would not be misleading. We continue to believe that such additional transparency in reporting can benefit Congress in its oversight role and improve public knowledge about the full costs of major federal construction projects. Related to recommendation two that GSA concurred with, the agency noted that it has other commissioning documents and processes outside of its *Building Commissioning Guide (Guide)* that it uses to ensure building systems are operating optimally. We believe GSA's use of other documents and processes is a good practice in light of the outdated nature of its current *Guide*, which serves as a key document in its commissioning process. Nevertheless, we continue to believe that it is important for GSA to update its outdated *Guide*, or replace it with appropriate industry-recognized standards and guidance to be consistent with GSA's current design standards and industry practices, as we recommended.

Finally, regarding recommendation three, after a discussion with GSA officials during the comment period, we modified the wording of the recommendation to recognize the range of administrative tools (e.g., policy, guidance, or other appropriate mechanism) that GSA could use to identify when and how Post Occupancy Evaluations (POEs) should be conducted and how lessons learned from those evaluations are

communicated. As we noted in the report, under its current process, GSA selects the number of facilities evaluated as its annual budget allows based on several selection factors. We continue to believe that GSA could benefit from a more formalized and strategic approach to identifying and communicating when and how POEs should be conducted to make best use of its limited resources. GSA also mentioned its Design Guide for Operational Excellence as a tool to communicate lessons learned from POEs. We agree that such a guide is a good example of how POEs can be used to inform the design of future projects. However, because the guide was based on a limited number of POEs from 2018, we believe that there is more GSA can do to maximize opportunities to communicate lessons learned to future project teams.

The draft report had included a fourth recommendation for the Administrator of the GSA to improve the transparency of what is being measured and reported in GSA's *Annual Performance Reports*, including noting any key limitations, such as comparing results from year to year if the measure changed. While GSA was reviewing the draft, the agency provided clarifications on the structure and content of its annual reports that mitigated our concerns about the transparency of the information being presented. As a result, we made changes to the body of the report and removed that recommendation from our final report.

GSA also provided technical and clarifying comments, which we incorporated, where appropriate.

We are sending copies of this report to the appropriate congressional committees and the Administrator of the General Services Administration. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or rectanusl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.



Lori Rectanus
Director, Physical Infrastructure Issues

Appendix I: General Services Administration's (GSA) Completed Major Construction Projects, Fiscal Years 2014 to 2018

Table 2: List of 36 of the General Services Administration's (GSA) Completed Major Construction Projects during Fiscal Years 2014 to 2018, Ordered by Total Construction Cost

Building name	Location (GSA Region)	Type	Total construction cost ^a	Project's delivery method	Fiscal year completed
U.S. Food and Drug Administration, White Oak Campus	White Oak, MD (11)	New	\$343,186,982	Design-Bid-Build	2014
Herbert C. Hoover Federal Building ^b	Washington, D.C. (11)	Repair and alteration (R&A)	\$242,603,342	CMc ^c	2014
Social Security Administration National Support Center ^d	Urbana, MD (3)	New	\$208,087,847	Design/Build	2014
San Ysidro Land Port of Entry	San Diego, CA (9)	New	\$182,468,568	CMc ^c	2015
U.S. Courthouse for the Utah District	Salt Lake City, UT (8)	New	\$168,343,215	CMc ^c	2014
Bishop Henry Whipple Federal Building ^b	Fort Snelling, MN (5)	R&A	\$164,213,570	CMc ^c	2014
Byron Rogers Federal Building ^b	Denver, CO (8)	R&A	\$160,227,841	Design/Build	2015
Benjamin P. Grogan and Jerry L. Dove Federal Building	Miramar, FL (4)	New	\$154,186,346	Design/Build-Bridging	2015
Mariposa Land Port of Entry ^b	Nogales, AZ (9)	New	\$146,859,510	Design-Bid-Build	2014
Consumer Financial Protection Bureau Headquarters	Washington, D.C. (11)	R&A	\$129,287,350	Design/Build-Bridging	2018
Peter W. Rodino Federal Building ^b	Newark, NJ (2)	R&A	\$117,531,201	Design/Build-Bridging	2015
Richard Bolling Federal Building ^b	Kansas City, MO (6)	R&A	\$116,660,891	CMc ^c	2015

**Appendix I: General Services Administration's
(GSA) Completed Major Construction Projects,
Fiscal Years 2014 to 2018**

Building name	Location (GSA Region)	Type	Total construction cost^a	Project's delivery method	Fiscal year completed
Prince Jonah Kuhio Kalaniana'ole Federal Building and U.S. Courthouse ^b	Honolulu, HI (9)	R&A	\$101,677,535	CMc ^c	2015
Lafayette Building ^b	Washington, D.C. (11)	R&A	\$90,127,973	Design-Bid-Build	2015
Mickey Leland Federal Building ^b	Houston, TX (7)	R&A	\$88,197,426	Design/Build-Bridging	2015
U.S. Courthouse for the Southern District of Alabama ^d	Mobile, AL (4)	New	\$72,636,673	Design/Build	2018
Charleston Regional Center-Building F	Charleston, SC (4)	New	\$53,452,573	Design-Bid-Build	2018
Stewart Lee Udall Department of the Interior Building ^{b,d}	Washington, D.C. (11)	R&A	\$51,675,044	Design-Bid-Build	2017
National Aeronautics and Space Administration-Integrated Engineering Services Building	Hampton, VA (3)	New	\$51,279,458	Design/Build-Bridging	2014
Tornillo-Guadalupe Land Port of Entry	Tornillo, TX (7)	New	\$50,327,965	Design-Bid-Build	2015
Richard H. Poff Federal Building ^b	Roanoke, VA (3)	R&A	\$48,076,217	CMc ^c	2014
Federal Building ^b	Huntington, WV (3)	R&A	\$42,040,706	CMc ^c	2015
Internal Revenue Service Enterprise Computing Center	Martinsburg, WV (3)	R&A	\$41,791,189	Design-Bid-Build	2014
Margaret Chase-Smith Federal Building and Courthouse ^d	Bangor, ME (1)	R&A	\$41,292,184	CMc ^c	2014
Federal Building and U.S. Custom House ^b	Denver, CO (8)	R&A	\$40,623,263	Design/Build	2014
Patrick V. McNamara Federal Building ^b	Detroit, MI (5)	R&A	\$38,552,563	CMc ^c	2014
Lafayette Building	Washington, D.C. (11)	R&A	\$30,396,281	Design-Bid-Build	2016
John F. Kennedy Federal Building	Boston, MA (1)	R&A	\$30,040,068	Design-Bid-Build	2014
Foreign Affairs Security Training Center	Blackstone, VA (3)	New	\$28,979,556	Design-Bid-Build	2017
Federal Deposit Insurance Corporation Headquarters	Washington, D.C. (11)	R&A	\$28,926,416	Design/Build-Bridging	2016
Harry S. Truman U.S. Diplomacy Center	Washington, D.C. (11)	New	\$27,587,271	Design-Bid-Build	2016
John Weld Peck Federal Building ^b	Cincinnati, OH (5)	R&A	\$26,711,187	CMc ^c	2014

**Appendix I: General Services Administration's
(GSA) Completed Major Construction Projects,
Fiscal Years 2014 to 2018**

Building name	Location (GSA Region)	Type	Total construction cost^a	Project's delivery method	Fiscal year completed
Joseph P. Kinneary U.S. Courthouse ^b	Columbus, OH (5)	R&A	\$25,286,965	CMc ^c	2014
Charles F. Prevedel Federal Building ^d	Overland, MO (6)	R&A	\$24,971,597	Design/Build-Bridging	2017
Sidney R. Yates Federal Building	Washington, D.C. (11)	R&A	\$24,568,700	Design/Build-Bridging	2014
Denver Federal Center	Lakewood, CO (8)	New	\$21,011,456	Service	2017
Total			\$3,213,886,928^e		

Source: GAO presentation of GSA Performance Data. | GAO-20-144

^aThe total construction cost is GSA's cost at substantial completion, as reported in their *Annual Performance Reports*.

^bAmerican Recovery and Reinvestment Act of 2009 project.

^cConstruction Manager as constructor (CMc).

^dCase study project.

^eMay not add up due to rounding.

Appendix II: Case Study Snapshots

This appendix contains information on five General Services Administration (GSA) case-study projects that we included in our review. We judgmentally selected these five major construction projects that were substantially completed between fiscal years 2014 through 2018 representing diversity in project type, geographic area, building-type, and range in cost and scope. Although not generalizable to all GSA major construction projects, information gathered from our case studies provides illustrative examples of GSA's monitoring and construction efforts.

For each case study, GSA provided us with extensive project documentation. We reviewed this documentation to obtain key information such as on contract award amounts and modifications that resulted in changes to the project's original budget or schedule. The contract modifications we discuss for each project are examples of modifications that added cost or credit to the final contract value or that changed the delivery schedule; however, these modifications do not necessarily include all the modifications to the construction contract. In addition, we interviewed relevant stakeholders, such as GSA project managers, contractors, and facility managers who were involved with the projects. All information in the case study narratives is attributable to GSA based on our review of project documentation and interviews with GSA project officials and stakeholders.

Charles F. Prevedel Federal Building

Location (GSA Region): Overland, Missouri (GSA Region 6)

Original Construction Completion Year: 1990

Project Type: Repair and Alteration

Project Delivery Method: Design/Build-Bridging

Background

The Charles F. Prevedel building was constructed in 1990. For fiscal year 2014, GSA proposed alterations and renovations to the building's interior

and upgrades to the building's systems such that the Veterans' Benefits Administration could consolidate into the building. The building was nearly two-thirds vacant at the time, as two federal tenants had moved out of the building. The Veterans' Benefits Administration had been dispersed in both a nearby federal building and leased space. GSA estimated that the Veterans' Benefits Administration's move into the consolidated space would save \$3.3 million annually in lease costs.

Project Scope

The building is five stories above-grade and two-stories below-grade. The project scope included renovating the building's central atrium; reconfiguring and increasing the building's useable space; replacing obsolete heating, ventilation, and air-conditioning (HVAC) systems; and, installing an energy-management control system to automate the HVAC and lighting systems and reduce energy consumption. The HVAC upgrades also included replacing and relocating the outdoor air intakes on the roof in order to meet current security requirements. Minor seismic upgrades were also implemented.

Contract Cost or Schedule Changes

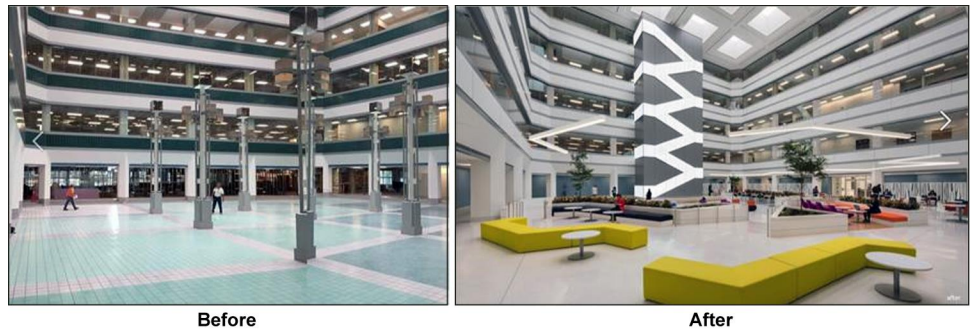
The design/build-bridging construction contract was awarded in January 2015 for \$21.8 million.¹ The construction contract cost was rebaselined to \$25.4 million, in part, to provide an additional stairwell to meet life-safety egress requirements as required by GSA's design guide. GSA reported that change required GSA's Public Buildings Commissioner to approve an overall project budget escalation of \$2.7 million in June 2015. GSA reported the final construction cost was \$25 million (roughly a 14.5 percent increase from the initial construction contract award). Construction of the repair and alteration project started in May 2015 and was substantially completed after a year and a half in November 2016, approximately 2 months earlier than originally projected.²

¹GSA's fiscal year 2014 prospectus to Congress estimated \$23 million for the cost of construction. The total estimated project budget was \$27.2 million, inclusive of construction, design, and GSA's management and inspection costs.

²In GSA's fiscal year 2014 prospectus, GSA estimated the project would be completed sometime in fiscal year 2017 (i.e., no later than the end of September 2017).

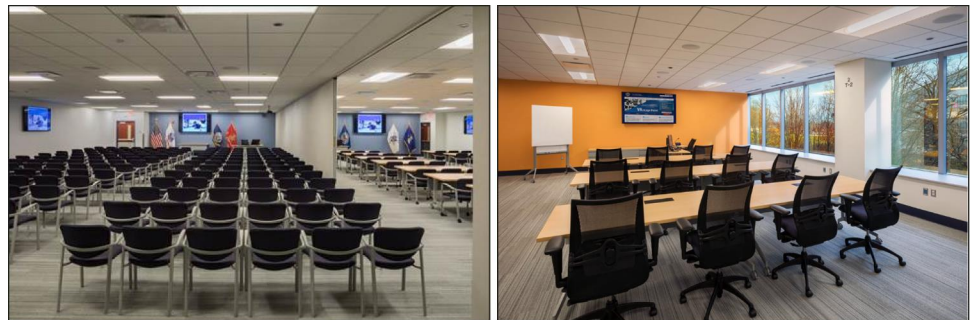
Figure 3 shows before and after views of the building’s main lobby and newly installed stairwell. Figure 4 shows views of meeting and training room spaces renovated during the project.

Figure 3: Charles F. Prevedel Federal Building’s Main Lobby and Atrium Space—before Renovations (Left) and after (Right)—Including the New Stairwell



Source: GSA. | GAO-20-144

Figure 4: Charles F. Prevedel Federal Building—Renovated Meeting and Training Room Spaces



Source: GSA. | GAO-20-144

Margaret Chase-Smith Federal Building and Courthouse

Location (GSA Region): Bangor, Maine (Region 1)

Original Construction Completion Year: 1967

Project Type: Repair and Alteration

Project Delivery Method: Construction Manager as Constructor (CMc)

Background

The 3-story Margaret Chase-Smith Federal Building and Courthouse was built in 1967 and had not had a major renovation since its construction. The project was funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act). GSA proposed the project be funded to recapture the vacant space in the building, which in part increased to approximately 33 percent after the U.S. Postal Service vacated.³ The proposed project would renovate and provide alterations to the building that would expand space for its existing tenants—including the U.S. Courts and the Social Security Administration, among others—and provide space for new tenant agencies.

Project Scope

GSA officials reported that in order to get the project started quickly using Recovery Act funds, GSA made the decision to deliver the project under the Construction Manager as Constructor (CMc) delivery method. Under CMc method, the contractor was brought in to advise on the design as it was being completed. In addition to space renovations and alterations, the project repaired and replaced HVAC systems, improved energy efficiency, and provided exterior structural improvements including the replacement of windows. New secure elevators were also added to improve court safety. Other components of the project included repairs and replacements of electrical systems, hazardous materials mitigation, elevator improvements, upgrades to the fire protection system, installing sprinklers, and correcting code deficiencies including bringing the building into compliance with accessibility standards.

Contract Cost or Schedule Changes

The CMc construction contract was initially awarded in March 2010 for \$33.9 million. In September 2010 (6 months later), two contract modifications totaling roughly \$4.6 million were issued to increase the contract price to reflect changes made in completing the design. GSA and the contractor reported that the baseline construction contract—after the design was completed—was \$38.5 million. While GSA had provided some funding allowances within the initial construction contract to

³According to GSA officials, because this project was a Recovery Act funded project, there was no GSA prospectus.

address some project requirements that were not yet fully designed—such as the building’s entry pavilion—another \$1.9 million contract modification was issued in March 2011 (a year after the initial contract award), in part, to increase the funding allowances for the front entry pavilion and to provide additional glass that was to be installed in the lobby area. The entry pavilion was added to improve the security screening process and adhere to the U.S. Marshalls Service and U.S. Courts screening station requirements. That \$1.9 million cost modification also addressed increased requirements associated with the geothermal heating system and below grade wells. Also, the contract costs increased, in part, due to tenant-requested changes. For example, an \$802,000 contract modification was issued, in part, for requested millwork (e.g., judge’s bench and cabinet work) and the Court’s audiovisual equipment, telecommunications, and data-related requirements. GSA reported the final construction cost was approximately \$41.3 million (about a 7.5 percent increase above the \$38.5 baseline).⁴ Construction of the repair and alteration project started in October 2010 and was substantially completed approximately one month early in November 2013.

Figure 5 shows the exterior of the building including its new entry pavilion. Figure 6 shows an exterior side view of the new entry pavilion and an interior view of the lobby.

⁴GSA’s Project Management Plan showed that in 2009, the estimated construction cost was \$44.4 million and that the total estimated project cost was \$54.4 million, inclusive of design, construction, and GSA’s management and inspection costs.

Figure 5: Margaret Chase-Smith Federal Building and Courthouse's Building Exterior with New Entry Pavilion



Source: GSA. | GAO-20-144

Figure 6: Margaret Chase-Smith Federal Building and Courthouse's Lobby (Left) and Entry Pavilion (Right)



Source: GSA. | GAO-20-144

Social Security Administration, National Support Center

Location (GSA Region): Urbana, Maryland (GSA Region 3)

Original Construction Completion Year: 2014

Project Type: New Construction

Project Delivery Method: Design-Build

Background

As part of the Recovery Act, the Social Security Administration received an appropriation to construct a new National Support Center to replace an older data center whose systems were approaching the end of their useful lives.⁵ The new National Support Center provides a state-of-the-art data center, added reliability, and the ability to expand to meet future needs. For example, the data center's flexible, scalable design allows for a smooth transition to future information technology upgrades and new, emerging technology.

Project Scope

The new 300,000 gross square foot data center complex—built on a 63 acre site—includes the data center, warehouse, and office building; the facility was built to accommodate 200 employees. The constructed facility—supporting 24 hours a day, 7 day a week operations—is Leadership in Energy and Environmental Design (LEED) Gold Certified, even though data centers traditionally rank among the largest power users in modern facilities.

Contract Cost or Schedule Changes

GSA's estimated construction cost for the project was adjusted down in August 2012 from \$334 million to \$262 million.⁶ GSA awarded the design-

⁵Funding for the project was transferred from the Social Security Administration to GSA. Because it was a Recovery Act project, there was no GSA prospectus for this project.

⁶The total project budget—inclusive of GSA site costs, GSA management and inspection costs, and furnishings and equipment—was originally estimated at \$400 million; when GSA adjusted the construction cost down in 2012, the total project budget was also adjusted down to \$326 million.

build construction contract in January 2012 for \$191.6 million.⁷ The project's construction contract cost was later rebaselined to \$207.4 million due in part to the Social Security Administration requesting GSA have the contractor provide operations and maintenance transition services for 6 months. That contract change was made in March 2014—approximately 4 months before substantial completion—for roughly \$2.1 million. GSA reported to us that the final construction cost was \$208.1 million (roughly an 8.5 percent increase from the base contract award).⁸ Because the construction cost was well below GSA's original construction estimate of \$334 million, GSA reported to us the remaining project funds were returned to the Social Security Administration in accordance with the Recovery Act appropriation. GSA issued a notice to proceed (i.e., contract start date) to the design-build contractor in January 2012 and the project was substantially completed on-schedule roughly two and a half years later in July 2014.

Figure 7 shows an exterior view of the main entrance to the data center. Figure 8 shows an interior view of the data center's server space prior to occupancy. Figure 9 shows an exterior view of the on-site solar panel array with the data center in the background.

⁷The contract was design-build contract, which means the contract included costs for both design and construction.

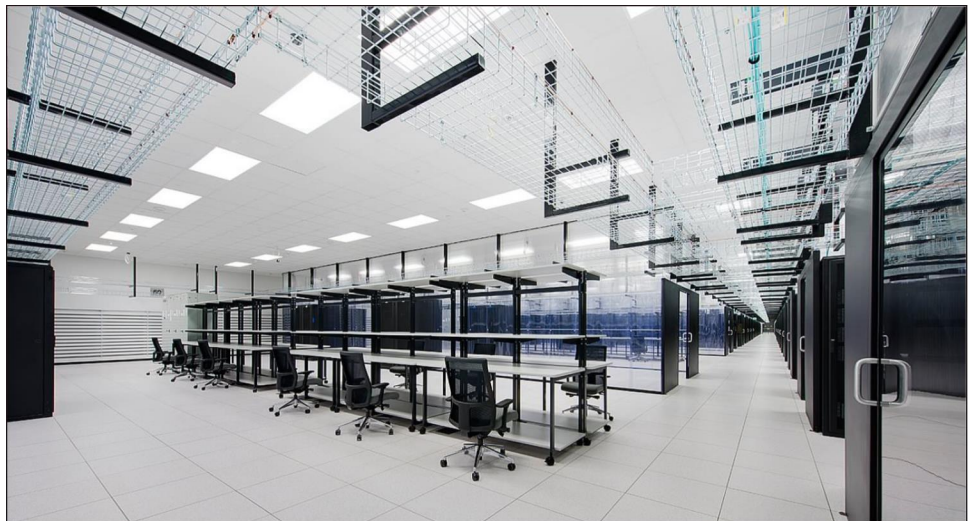
⁸GSA reported that the majority of the \$16 million contract cost increase was due to furniture, fixtures, and equipment.

Figure 7: Social Security Administration, National Support Center – Main Entrance



Source: GSA. | GAO-20-144

Figure 8: Social Security Administration, National Support Center – Data Center Server Space



Source: GSA. | GAO-20-144

Figure 9: Social Security Administration, National Support Center - On-site Solar Panel Array outside the Data Center



Source: GSA. | GAO-20-144

Stewart Lee Udall Building, Department of the Interior

Location (GSA Region): Washington, D.C. (Region 11)

Original Construction Completion Year: 1936

Project Type: Repair and Alteration

Project Delivery Method: Design-Bid-Build

Background

The Department of the Interior (Interior) headquarters building—occupying two city blocks—was initially completed in 1936; upgrades to the building’s systems were required to extend the useful life of the building, support Interior’s operations, and meet current building codes and standards. In 2000, GSA began the construction of its multi-year, six-phase modernization plan, where each of the building’s six wings was to be modernized during one of the six phases.

Project Scope

Phase 6 (Wing 1)—the final phase of the building’s modernization— included upgrading the mechanical and electrical systems, replacing the lights and ceiling systems, installing fire safety upgrades and emergency egress stairs, upgrading restrooms, improving accessibility, and restoring historic spaces to include the auditorium, library, and the Undersecretary’s and Secretary’s suites.

Contract Cost or Schedule Changes

In 2001, GSA originally negotiated with the contractor the costs to execute Phase 6, which was structured as a contract option. The option could be exercised at GSA’s discretion upon receiving funding but allowed for future, economic price escalation, for inflation. The contract price in 2001 for the Phase 6 scope was approximately \$19.3 million. Because appropriated funding was not received until fiscal year 2014, that earlier contract pricing was contractually updated by GSA in 2014 to roughly \$38 million; however, that figure included roughly \$4.5 million in additional scope that GSA added into the project.⁹ The additional scope included, among other items, that the Phase 6 space was to be certified under the Leadership in Energy and Environmental Design criteria and that lessons learned from the earlier completed phases—implemented over nearly 15 years—would be incorporated into the Phase 6 project. Additionally, Interior asked GSA that parts of the library be converted into office spaces to increase the building’s space efficiency and allow Interior to move more personnel into the building. That contract change, for about \$6.2 million, was made in May 2016 and also resulted in the schedule’s being rebaselined, adding about one year to the project’s duration. GSA reported that Interior provided \$17.7 million in additional funding, inclusive of the costs for converting the library space.¹⁰ GSA reported that the construction contract cost for Phase 6 was \$51.7 million (about a 36 percent increase above the 2014 adjusted, base contract cost of \$38

⁹GSA reported that the 2001 base bid with all options was valued at \$19.3 million and was economically adjusted— from 2001 bid dollars to 2014 award dollars—to \$33.2 million.

¹⁰GSA reported that the additional cost increases included, historic mural conservation, elevator upgrades, and structural work associated with the library space, among other things.

million).¹¹ Phase 6's construction started in May 2014 and was completed approximately 3 years later in June 2017.¹²

Figure 10 shows the exterior of the Department of Interior headquarters building with its six wings. Figure 11 shows interior view of historic spaces that were restored during Phase 6.

Figure 10: Stewart Lee Udall Department of the Interior Building – Exterior View Showing the Building's Six Wings



Source: GSA. | GAO-20-144

¹¹GSA's fiscal year 2014 prospectus showed the estimated construction cost for Phase 6 was roughly \$51.6 million. The total Phase 6 project estimated cost—inclusive of construction, design and GSA's management and inspections costs—was \$60.1 million. In its prospectus, GSA also reported to Congress that the total project cost for the entire modernization of the Interior headquarters was roughly \$282.3 million, of which \$242 million was for the total estimated construction costs of all six phases. The remaining, roughly \$40.3 million, was the estimated costs for design and GSA's management and inspection costs for all six phases.

¹²In GSA's fiscal year 2014 prospectus to Congress, GSA estimated Phase 6 would be completed in fiscal year 2015 (i.e., no later than the end of September 2015).

Figure 11: Stewart Lee Udall Department of Interior Building – Renovated Historic Spaces: Library (Left); Secretary’s Suite (Center); and Auditorium (Right)



Source: GSA. | GAO-20-144

United States Courthouse for the Southern District of Alabama

Location (GSA Region): Mobile, Alabama (GSA Region 4)

Original Construction Completion Year: 2018

Project Type: New Construction

Project Delivery Method: Design-Build

Background

The primary driver for the project was to address the long term housing needs of the United States Courts and related agencies. The District Court required additional space that the adjacent existing John A. Campbell Courthouse could not provide, and GSA determined that a new courthouse was necessary to accommodate the Courts' projected 10 to 30 year space needs. The Campbell Courthouse renovation followed the new courthouse construction to allow for the relocation of the Bankruptcy and Probation Courts from leased space, and allow for the full Court family to be co-located between the two adjacent buildings.

Project Scope

The new courthouse building, adjacent to the existing Campbell Courthouse, was designed to provide 155,600 gross square feet of

space, including parking.¹³ The building houses six courtrooms, nine judges' chambers, the United States Marshalls Service, 38 below-grade parking spaces, and the capability to expand and accommodate eight additional courtrooms in the future.

Contract Cost or Schedule Changes

In fiscal year 2010, the new construction project received partial funding in an appropriation in the amount of \$50 million, for construction.¹⁴ However, the project was not awarded at that time. The U.S. Courts and GSA had to revisit the long-term space needs for the U.S. Courts, which was later done as part of GSA's 2013 feasibility study. In fiscal year 2014, an additional \$69.5 million was appropriated for a new approach that would involve repairs and alterations to the existing Campbell Courthouse, as well as the construction of a new federal courthouse (which was to be smaller than originally designed), adjacent to the Campbell Courthouse. GSA fiscal year 2014 documentation for the new courthouse project estimated the total design cost at \$8.5 million and the total construction cost at \$71.1 million, which excluded any prior funding spent on site acquisition costs and the project's earlier design.¹⁵ In April 2015, GSA awarded a single design-build contract for both the design and construction of the new courthouse and for the repairs and alteration of the existing Campbell Courthouse. GSA baselined the construction cost for the new courthouse—exclusive of the costs for the Campbell Courthouse alterations—at \$70 million. GSA data showed that the final construction cost for the new courthouse was \$72.6 million (an increase of about 4 percent over the baseline cost of \$70 million; roughly 9 percent less than the \$79.6 million total estimated costs for both the design and

¹³17,100 gross square feet is for parking.

¹⁴The purchase of the site and an earlier design for the new courthouse project was initially funded in fiscal year 2002. GSA documentation showed that GSA spent approximately \$6.0 million for the site and \$6.3 million for an earlier project design, which ultimately was not the design that was used for the construction of the new courthouse.

¹⁵GSA fiscal year 2014 project documentation estimated that the new courthouse total project cost was \$85.9 million, inclusive of the design and construction costs and GSA's management and inspection costs. That total estimate does not include the costs for the repair and alterations to the Campbell Courthouse.

construction).¹⁶ Construction started in Spring 2016 and was completed in just over 2 years, in June 2018.¹⁷ The schedule was rebaselined by roughly a month for severe weather delays during the construction.

Figure 12 shows the exterior of the new U.S Courthouse and two interior spaces.

Figure 12: U.S. Courthouse, Mobile, Alabama – Courthouse Exterior (Left); Main Lobby (Center); One courtroom (Right)

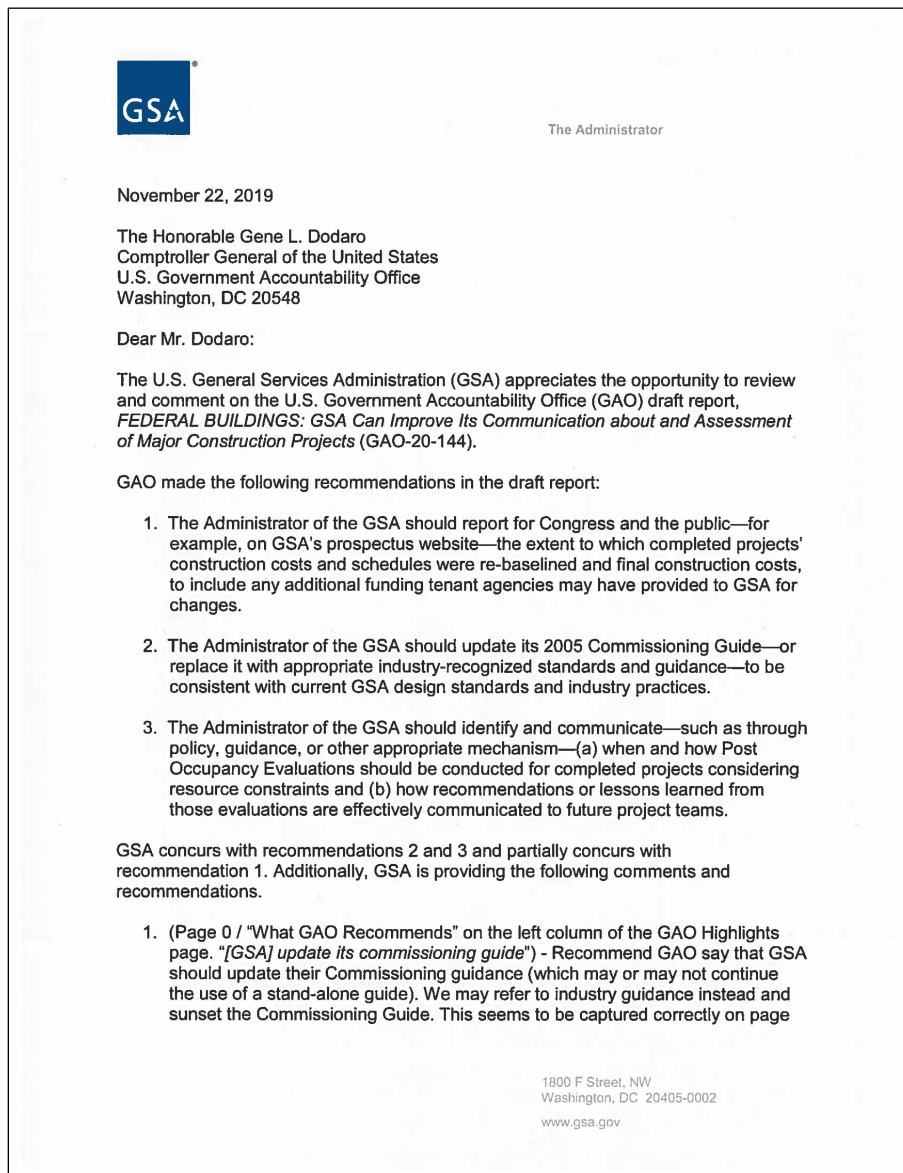


Source: GSA. | GAO-20-144

¹⁶While the construction contract costs increased after the initial award, the increases were within the allowable cost contingency. Examples of changes that increased the cost included a change made by GSA to increase the amount of outdoor air brought into the building to improve humidity control and a request by the tenant agency, the Courts, to have GSA install the Courts' audiovisual systems.

¹⁷The design work—under the design-build contract—began in May 2015.

Appendix III: Comments from the General Services Administration



20 and 24, but the page 0 left-side comment should be updated to reflect this strategy.

2. (Page 19, middle of last paragraph / *"Without updated guidance, GSA's commissioning activities may be limited in their effectiveness in assuring building systems are operating optimally."*) – The referenced excerpt indicates GSA's commissioning activities' effectiveness may be limited with outdated guidance but does not address other commissioning documents and processes that GSA uses to ensure the project building systems are operating optimally. Recommend the report address other documents or processes investigated for the five case study projects that affected the building system's optimal operation.
3. (Page 19, last paragraph and page 20, first paragraph / *"Two of the five GSA contractors we interviewed expressed frustration that the commissioning process on their projects did not run smoothly. GSA's external peer reviews for those same two projects also found that the roles of the various stakeholders in the commissioning process were not clear. In addition, three stakeholders on one of those projects said that some stakeholders—especially GSA's contracted design team—were not fully involved during part of building's commissioning."*)

In response to these remarks, it is important to note that the commissioning process may not always appear to run smoothly in the early stages of the project; however, our construction excellence peer review process is designed to address such issues. The peer review process includes a requirement for the regional team to provide a response to the issues raised by the peers within 60 days of the review. That response should specifically address, with a solution, any concerns raised by the peers in the first peer review (15%-20% completion) and be re-examined in the second peer review (50-60% completion) to ensure the issue is resolved and new issues can be addressed.

4. (Page 24 - Recommendation #1 – *"The Administrator of the GSA should report for Congress and the public—for example, on GSA's prospectus website—the extent to which completed projects' construction costs and schedules were re-baselined and final construction costs, to include any additional funding tenant agencies may have provided to GSA for changes."*) – GSA agrees to publish the following schedule and budget results for the Capital Program: Funding amounts as set forth in resolutions adopted by the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives, final GSA total construction costs at project completion, estimated schedule at point of prospectus submission, estimated schedule at construction award, and final schedule at substantial completion. GSA believes it would not be helpful to publish any additional funding provided by tenant agencies as this level of detail would be misleading and misrepresent what the Committees approved in adopted resolutions and the full Congress subsequently appropriated to GSA. Tenant agencies receive separate appropriations from Congress and certify that its funding is available for use on a

capital construction project. As such, the reporting of those funds should be the tenant agency's responsibility. To only compare what was originally identified in a prospectus to what was ultimately expended by both GSA and its customers would not accurately reflect how GSA managed to an original budget and schedule.

5. (Page 25 - Recommendation #3 - "*The Administrator of the GSA should identify and communicate—such as through policy, guidance, or other appropriate mechanism—(a) when and how Post Occupancy Evaluations should be conducted for completed projects considering resource constraints...*") – As a result of a conversation with the GAO on October 29, this recommendation was modified. (New recommendation is shown above.) Additionally, under the current process, GSA selects the number of facilities evaluated as the annual budget allows, and selects the specific facilities based on the following: those occupied greater than one year, as well as a mixture of facility type (Federal building, courthouse, land port of entry, or other), construction type (new construction or modernization), and regional diversity when possible. Page 0 left-side comment should be updated to reflect this strategy.
6. (Page 25 - Recommendation #3 - "*The Administrator of the GSA should identify and communicate—such as through policy, guidance, or other appropriate mechanism... (b) how recommendations or lessons learned from those evaluations are effectively communicated to future project teams.*")

GSA previously provided the public version of *Design Guide for Operational Excellence* along with the *Operational Excellence Memorandum* to the GAO on September 10, 2019. This memorandum requires the use of the newly developed *Design Guide for Operational Excellence* for new buildings, repairs, renovations, modernizations, and alterations. This Design Guide is based largely on information contained in the Post Occupancy Evaluation reports. Page 0 left-side comment should be updated to reflect this strategy.

If you have any questions or concerns, please contact me at (202) 969-7277 or Jeffrey A. Post, Associate Administrator, Office of Congressional and Intergovernmental Affairs, at (202) 501-0563.

Sincerely,



Emily W. Murphy
Administrator

cc. Lori Rectanus, Director, Physical Infrastructure Issues, GAO

Text of Appendix III: Comments from the General Services Administration

Page 1

November 22, 2019

The Honorable Gene L. Dodaro Comptroller General of the United States

U.S. Government Accountability Office

Washington, DC 20548

Dear Mr. Dodaro:

The U.S. General Services Administration (GSA) appreciates the opportunity to review and comment on the U.S. Government Accountability Office (GAO) draft report, **FEDERAL BUILDINGS: GSA Can Improve Its Communication about and Assessment of Major Construction Projects (GAO-20-144)**.

GAO made the following recommendations in the draft report:

1. The Administrator of the GSA should report for Congress and the public-for example, on GSA's prospectus website-the extent to which completed projects' construction costs and schedules were re-baselined and final construction costs, to include any additional funding tenant agencies may have provided to GSA for changes.
2. The Administrator of the GSA should update its 2005 Commissioning Guide-or replace it with appropriate industry-recognized standards and guidance-to be consistent with current GSA design standards and industry practices.
3. The Administrator of the GSA should identify and communicate-such as through policy, guidance, or other appropriate mechanism-(a) when and how Post Occupancy Evaluations should be conducted for completed projects considering resource constraints and (b) how recommendations or lessons learned from those evaluations are effectively communicated to future project teams.

GSA concurs with recommendations 2 and 3 and partially concurs with recommendation 1. Additionally, GSA is providing the following comments and recommendations.

1. (Page 0 / "What GAO Recommends" on the left column of the GAO Highlights page. "[GSA] update its commissioning guide") - Recommend GAO say that GSA should update their Commissioning guidance (which may or may not continue the use of a stand-alone guide). We may refer to industry guidance instead and sunset the Commissioning Guide. This seems to be captured correctly on page

Page 2

20 and 24, but the page 0 left-side comment should be updated to reflect this strategy.

2. (Page 19, middle of last paragraph / "Without updated guidance, GSA's commissioning activities may be limited in their effectiveness in assuring building systems are operating optimally.")- The referenced excerpt indicates GSA's commissioning activities' effectiveness may be limited with outdated guidance but does not address other commissioning documents and processes that GSA uses to ensure the project building systems are operating optimally. Recommend the report address other documents or processes investigated for the five case study projects that affected the building system's optimal operation.

3. (Page 19, last paragraph and page 20, first paragraph / "Two of the five GSA contractors we interviewed expressed frustration that the commissioning process on their projects did not run smoothly. GSA's external peer reviews for those same two projects also found that the roles of the various stakeholders in the commissioning process were not clear. In addition, three stakeholders on one of those projects said that some stakeholders-especially GSA's contracted design team-were not fully involved during part of building's commissioning.

In response to these remarks, it is important to note that the commissioning process may not always appear to run smoothly in the early stages of the project; however, our construction excellence peer review process is designed to address such issues. The peer review process includes a requirement for the regional team to provide a response to the issues raised by the peers within 60 days of the review. That response should specifically address; with a solution, any concerns raised by the peers in the first peer review (15%-20% completion) and be re-examined in the second peer review (50-60% completion) to ensure the issue is resolved and new issues can be addressed.

Page 3

capital construction project. As such, the reporting of those funds should be the tenant agency's responsibility. To only compare what was originally identified in a prospectus to what was ultimately expended by both GSA and its customers would not accurately reflect how GSA managed to an original budget and schedule.

1. (Page 25 - Recommendation #3 - "The Administrator of the GSA should identify and communicate-such as through policy, guidance, or other appropriate mechanism-(a) when and how Post Occupancy Evaluations should be conducted for completed projects considering resource constraints...")-As a result of a conversation with the GAO on October 29, this recommendation was modified. (New recommendation is shown above.) Additionally, under the current process, GSA selects the number of facilities evaluated as the annual budget allows, and selects the specific facilities based on the following: those occupied greater than one year, as well as a mixture of facility type (Federal building, courthouse, land port of entry, or other), construction type (new construction or modernization), and regional diversity when possible. Page O left-side comment should be updated to reflect this strategy.

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If you have any questions or concerns, please contact me at (202) 969-7277 or

Jeffrey A. Post, Associate Administrator, Office of Congressional and Intergovernmental Affairs, at (202) 501-0563.

Sincerely,

Emily W. Murphy Administrator

cc. Lori Rectanus, Director, Physical Infrastructure Issues, GAO

4. (Page 24 - Recommendation #1 - "The Administrator of the GSA should report for Congress and the public-for example, on GSA's prospectus website-the extent to which completed projects' construction costs and schedules were re-baselined and final construction costs, to include any additional funding tenant agencies may have provided to GSA for changes.")- GSA agrees to publish the following schedule and budget results for the Capital Program: Funding amounts as set forth in resolutions adopted by the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives, final GSA total construction costs at project completion, estimated schedule at point of prospectus submission, estimated schedule at construction award, and final schedule at substantial completion. GSA believes it would not be helpful to publish any additional funding provided by tenant agencies as this level of detail would be misleading and misrepresent what the Committees approved in adopted resolutions and the full Congress subsequently appropriated to GSA Tenant agencies receive separate appropriations from Congress and certify that its funding is available for use on a

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Lori Rectanus, (202) 512-2834, rectanusl@gao.gov

Staff Acknowledgments

In addition to the contact named above, Mike Armes (Assistant Director); Catherine Kim (Analyst-in-Charge); John Bauckman; Delwen Jones; Timothy Kinoshita; Ying Long; Malika Rice; Rachel Stoiko; and Crystal Wesco made key contributions to this report.

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